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BY WILLIAM FALOON

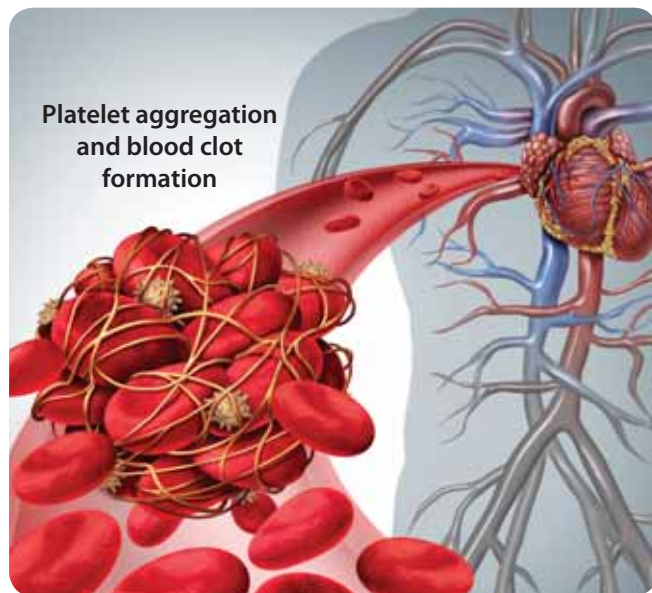
Why Many People May Not Need Aspirin Today

Starting in the **1970s**, a number of published studies found that people who regularly took **aspirin** had reduced risk of **heart attack** and other vascular disorders.¹⁻⁴

As evidence mounted, the **FDA** approved low-dose **aspirin** in **1998** to treat high-risk patients, including those who had already suffered a heart attack or ischemic stroke.

Tacit approval to take **low-dose aspirin** daily was also given for healthy adults concerned about occlusive vascular disorders.

One of aspirin's beneficial effects is to prevent **blood platelets** from **clumping** and blocking blood flow,^{5,6} including inside a coronary or cerebral artery.



Back in the early years when aspirin demonstrated efficacy, the typical Americans' behavior patterns put them at high risk for abnormal **platelet clumping**, which in turn caused soaring numbers of **heart attacks** and **strokes**.⁷

In the period of **1980 to 2014**, however, death rates from cardiovascular disease incrementally plummeted by **50%**.⁸

This improvement coincides with better control of **blood pressure** and **lipids**, and a decrease in smoking tobacco,^{5,6} along with changing dietary practices and improved cardiovascular procedures and interventions.

Overlooked by the mainstream is an almost **20-fold** increase in the use of **dietary supplements**, many of which have many similar effects as **aspirin** in protecting the cardiovascular system.⁹

Recent studies are finding that **aspirin** is not reducing heart attack/stroke risk in today's healthier American population compared to *earlier* decades.^{5,6} Aspirin is still proving effective in certain high-risk groups, as will be described in this editorial.^{5,10}

So the debate swirling in medical settings is whether otherwise healthy Americans should continue taking low-dose aspirin.

Our analysis reveals that adults at **low risk** of cardiovascular disease who control their risk factors, including protecting against abnormal **platelet clumping**, may not need daily low-dose aspirin. This editorial describes our rationale.

AS WE SEE IT

If we travel back to the **1950s-1970s** era, a typical American man or woman might, after waking up, eat a breakfast consisting of bacon, eggs, and buttered toast, with sugar and/or cream-laden coffee. Many would also light up a cigarette.

The morning hours are when blood **platelets** are most “sticky.”

Mornings are also when most sudden **heart attacks** were occurring in those decades.¹¹

Consumption of polyphenol-rich **fruits, vegetables, and dietary supplements** in this **1950s-1970s** period was low.

Systolic **blood pressure** over **150 mmHg** was quite normal, and many people had high **cholesterol** levels,^{12,13} sometimes exceeding **300 mg/dL**.

Add together the above five paragraphs and you may see why sudden-death **heart attacks** surged to epidemic levels during the **1950s-1970s** period.

Typical **breakfast** foods consumed in that time period increased abnormal **platelet aggregation** (clumping), **smoking** caused more **platelet clumping**, and few anti-platelet-clumping foods or **nutrients** were consumed.

*“In 1965, 45% of Americans smoked, today it’s only 15%... That’s the lowest percentage ever recorded.”**

*Smithsonian.com based on Centers for Disease Control and Prevention 2015 report.¹⁹

So, when studies published in the prior decades identified regular **aspirin** users as having reduced heart attack rates, there was a biological explanation for this, since aspirin markedly lowered the **platelet clumping** that was encouraged by typical lifestyles during this era.

What Has Changed Today?

Even a cursory look at health behavior patterns in the **1950s-1970s** compared to recent years reveals startling changes.

There have been huge reductions in average **blood pressure** readings and **lipid** numbers.^{12,14,15} These two factors alone dramatically reduce **platelet clumping** (thrombotic) risks.^{16,17}

Dietary practices among health-conscious individuals reduce or eliminate **breakfast foods** like bacon, ham, and fried eggs that contribute to **platelet aggregation**.

Specifically, health-conscious individuals have become aware that ingestion of **saturated fats** (and certain other fats like *trans*-fats) is a culprit behind **platelet aggregation** and subsequent coronary heart attacks and ischemic strokes.

Tobacco usage has plummeted¹⁸ while intake of **nutrients** that protect *against* **platelet aggregation** has soared.

Stated succinctly, there is no comparison between the vascular health status of the typical American in the **1950s-1970s** and the same indices in more recent decades.

Plummeting incidences of heart attacks and strokes caused by **abnormal platelet aggregation** attest to this.

So, while aspirin saved many lives in the past, it may not have this same effect today. That’s because there is far less abnormal **platelet clumping** and thus less coronary or cerebral artery blockage (occlusion) happening.^{5,6}





Foods and Nutrients with Anti-Platelet Properties

Olive Oil

Phenolic-rich olive oil preparations have demonstrated decreases in the production of proinflammatory and prothrombotic factors in human studies.^{43,44} In a study in healthy men, olive oil's oleocanthal content was correlated with its ability to inhibit platelet aggregation.⁴⁵

Tea

Tea consumption has protective effects on cardiovascular health. Purified green tea polyphenols, such as **EGCG**, reduce platelet aggregation in isolated human platelets.⁴⁶

Quercetin

Quercetin has demonstrated success inhibiting platelet aggregation. Single doses of quercetin glucosides, the naturally occurring form of quercetin (150 or 300 mg), from food sources and higher quality dietary supplements, were able to significantly inhibit collagen-induced platelet aggregation in one small human study.⁴⁷

Fish Oil

Several human studies observed the antithrombotic activities of fish oil.⁴⁸ Consumption of fish oil decreases platelet activation⁴⁹ and aggregation.⁵⁰ In type II diabetic patients, the pooled data from three human trials demonstrated a reduction in platelet aggregation.⁵¹

Curcumin

Human trials reveal the effects of curcumin on reducing lipid peroxidation^{52,53} and plasma fibrinogen,⁵⁴ both factors in the progression of atherosclerosis.⁵⁵ Another mechanism by which curcumin inhibits platelet aggregation is through dampening expression of *P-selectin*, an adhesion molecule expressed on both activated endothelial cells and platelets that mediates aggregation between these two cell types.⁵⁶ *P-selectin* also recruits leukocytes to the forming thrombus.

Pine Bark Extract

An extract rich in polyphenols with anti-inflammatory and free-radical scavenging properties, has been found to stabilize vascular collagen and prevent blood clots.⁵⁷ In *in vitro* research, pine bark extract reduced cytokine-related expression of adhesion molecules by endothelial cells, thereby reducing the likelihood of blood cell aggregation, in response to inflammatory signaling.⁵⁸

Pomegranate

Two weeks of pomegranate juice consumption (**50mL/day**) reduced platelet aggregation by **11%** in a small study of 13 healthy individuals.⁵⁹ In a human clinical trial, pomegranate juice consumption was shown to improve a measure of thrombotic risk in as little as six hours after consumption.⁶⁰

Nutrients That Impede Platelet Aggregation

Thrombosis is the leading cause of death in persons over age 50.²⁰

The major cause of thrombosis is abnormal **platelet aggregation** (clumping) inside arteries and veins.

It is critical that aging persons follow **anti-thrombotic** practices that include ingesting **nutrients** that help prevent blood platelets from sticking together.

I believe *every* reader of *Life Extension Magazine*® is already taking many of these **anti-platelet** nutrients. They include plant polyphenols like **curcumin**, **green tea**, **pine bark**, and **pomegranate**, optimized forms of **folate**, vitamins **B6** and **B12**, along with **omega-3** fatty acids.²¹⁻²⁷

These nutrients have **differing** anti-platelet properties. This is important because there are several mechanisms that cause abnormal **platelet aggregation**.

Compare what health-conscious Americans have done in recent decades to reduce their thrombotic **heart attack** and **stroke** risks to the **1950s-1970s** period. The difference is night and day.

It helps explain why recent studies seeking to demonstrate the effect of **aspirin** on heart attack prevention in healthy people have largely failed to do so.²⁸⁻³²

Today's radically altered health behavior patterns drastically reduce platelet stickiness. Further reducing platelet aggregation with **aspirin** may not add additional benefit to healthy people, as recent studies indicate.^{5,6}

Blood Pressure and Platelet Aggregation

With each heartbeat, blood is pushed through your arteries into microscopic capillaries and then out through veins for return to your heart.

Elevated systolic **blood pressure** increases mechanical stress that compromises the integrity of the inner arterial wall called the **endothelium**. This can lead to a **pro-inflammatory** and **pro-thrombotic** state that is an underlying cause of heart attack or ischemic stroke.

Blood pressure guidelines in earlier years allowed levels that were too high. Back in those days medications to treat hypertension were not particularly effective compared to more recent decades.³³

When **aspirin** was showing significant efficacy in reducing heart attack risk, people with high blood pressure, including prehypertension, were not adequately controlling it with diet, lifestyle, and medication.

This same problem persists today among people who are not proactive in protecting against vascular disease.

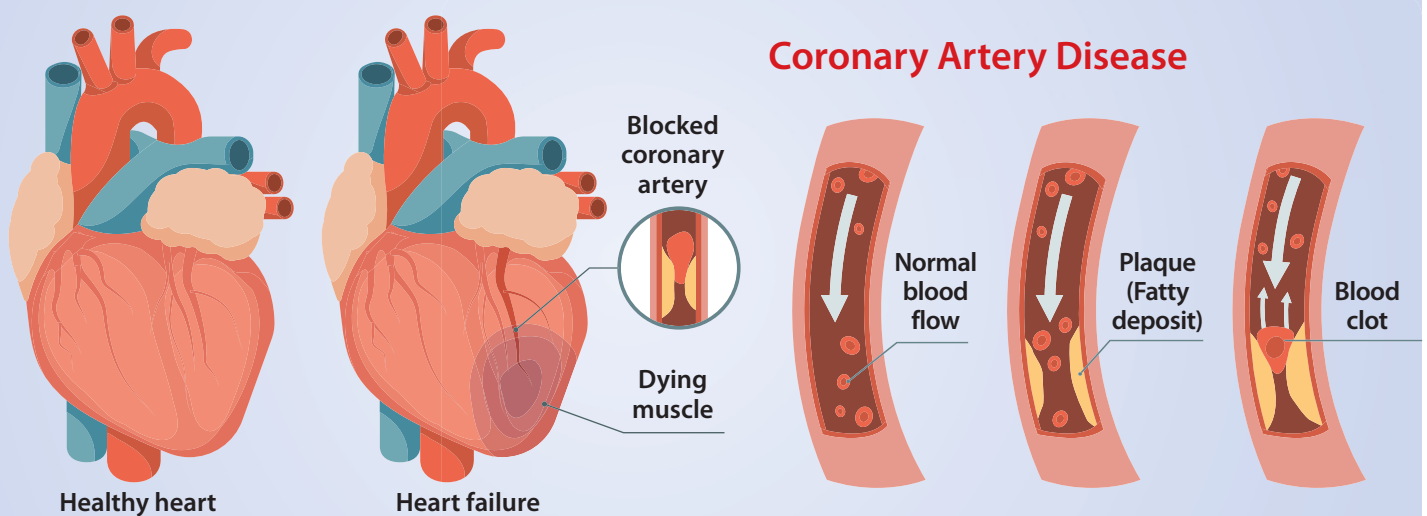
Average blood pressure readings have been dropping in recent decades in most population groups, though the growing number of overweight/obese individuals is counteracting this favorable trend.

Those who achieve better **blood pressure** control enjoy reduced platelet aggregation.³⁴

These individuals are therefore less likely to benefit from daily aspirin use compared to past generations that lived with elevated blood pressure.

Lipids and Blood Pressure

In the early 1980s, the standard reference ranges for **LDL cholesterol** and **triglycerides** were too high. These antiquated reference ranges put many people at risk for coronary artery occlusion and subsequent heart attack (myocardial infarction) in earlier decades.



American Heart Association Update

March 18, 2019

Earlier this year, the **American Heart Association** published an article that corresponds to much of what we state as it relates to changing American health behavior patterns. Here is an excerpt from the news report:

“Heart attack rates have gone down in more modern society with lower smoking rates and better treatment of blood pressure, better treatment of cholesterol... There probably was more of a role for aspirin back in the older trials, even though the bleeding issue has always been seen there.”³⁶

The reasons cited by the American Heart Association, and many more provided in this editorial, indicate why otherwise healthy American adults may no longer need low-dose aspirin for primary heart attack prevention.



Elevated lipids accelerate atherosclerotic processes. This increases the risk of platelets aggregating around unstable arterial plaque and causing coronary and cerebral artery blockages.

Huge declines in average **lipid levels** beginning in the late **1980s** provide further rationale for why aspirin is not demonstrating similar beneficial effects in more recent studies.^{5,6,12,15}

Back in the previous period (1950s-1970s) little was done in the conventional setting to prevent atherosclerosis, be it diet, exercise, supplements or drugs.

These facts cannot be overstated. When Americans were suffering epidemic levels of **heart attacks**, laboratory reference ranges for blood **lipids** were frighteningly high.

This predisposed a large swath of Americans to abnormal **platelet aggregation** that **aspirin** helped protect against.

Many of today's health-conscious people may no longer need this additional **anti-platelet** protection, as their **blood pressure** and **blood lipids** are markedly lower.

Who Should Take Aspirin?

The term “**primary prevention**” applies to the use of low-dose aspirin in seemingly healthy individuals who have elevated **risk factors** for coronary heart attack and ischemic stroke.

The box on the next page describes patient groups who should be taking low-dose aspirin for **primary prevention**, i.e. before they suffer a thrombotic heart attack or stroke.

The term “**secondary prevention**” applies to people who *already* suffer angina and/or severe coronary blockage, or are survivors of a heart attack, transient ischemia attack, ischemic stroke or other occlusive arterial disease.

For this group of individuals with preexisting vascular disease, **aspirin** is clearly established for **secondary prevention**, i.e. preventing another cardiovascular event.^{10,35}

The debate going on now is what to recommend to normal, aging people with borderline vascular risks.

Alternative practitioners have long claimed the **anti-platelet** effects of

healthy diets, exercise, and nutrient extracts that exhibit aspirin-like properties are more than sufficient.

The bottom line is that there are no clear-cut answers for otherwise healthy, aging people.

What Should You Do?

For many readers of this magazine, daily low-dose aspirin may be a reasonable option, but there is no real “typical” reader of this magazine.

I’m sometimes surprised that those who support our healthy longevity projects do not always optimize their own cardiovascular health.

What’s important to understand is that there are several mechanisms by which an abnormal clot can form inside a blood vessel.

By consuming a healthy **diet**, taking a spectrum of **anti-platelet nutrients**, and avoiding other **platelet clumping** factors, thrombotic risks are likely to be significantly reduced, and the published medical literature supports this.

Current Conventional “Primary Prevention” Guidelines for Daily Low-Dose Aspirin

Primary prevention in cardiovascular disease is defined as reducing the risk of having an initial cardiovascular event, like a heart attack (myocardial infarct) or stroke (cerebrovascular accident).

In comparison, **secondary prevention** is defined as reducing the risk of having a second, or subsequent, cardiovascular event.

Low-dose (**75-100 mg daily**) aspirin use for **secondary prevention** is well established.³⁵

However, based upon several new, high-quality clinical studies (randomized, placebo-controlled, direct intervention trials), the use of aspirin for generalized **primary prevention** has been revised.²⁸⁻³²

These revisions reflect the differences between patient populations today in comparison with the past^{5,6} – for example, patients today achieve better blood pressure control, have better cholesterol profiles, and use less tobacco than “comparable” patients in the past, especially 30-plus years ago.

According to the 2019 Guidelines for Primary Prevention of Cardiovascular Disease from the American College of Cardiology (ACC) and the American Heart Association (AHA), current recommendations on the use of aspirin for **primary prevention** stipulate:⁵

- Low-dose aspirin (**75-100 mg orally daily**) may be considered for primary prevention of cardiovascular disease in high-risk adults (e.g., patients at high risk of a cardiovascular event, like type II diabetes patients as well as those patients with multiple cardiovascular risk factors such as poor blood pressure control, active tobacco use, and elevated LDL cholesterol) aged 40-70 years, not at increased bleeding risk;
- Low-dose aspirin should not be administered on a routine, generalized basis for primary prevention of cardiovascular disease among otherwise healthy adults >70 years, not at high cardiovascular risk;
- Low-dose aspirin should not be administered for primary prevention among adults at any age who are at increased bleeding risk.

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For longer life,



William Faloon, Co-Founder
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P.S. For an in-depth review of different approaches to reduce a hypercoagulability condition and/or abnormal platelet aggregation please visit our **blood-clot prevention** protocol at: LifeExtension.com/thrombosis



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Reduced Secondhand Smoke Exposure Slashes Thrombotic Cardiovascular Risks

Most of you may recall being chronically exposed to other people's **cigarette smoke** in the workplace, around recreation areas, while traveling, and at home.

Here is what the Surgeon General and the Institute of Medicine write about the cardiovascular dangers of secondhand smoke:³⁷⁻⁴²

- Exposure to secondhand smoke has immediate adverse effects on the cardiovascular system and can cause coronary heart disease and stroke.
- Secondhand smoke causes nearly **34,000** premature deaths from heart disease each year in the United States among nonsmokers.
- Nonsmokers who are exposed to secondhand smoke at home or at work increase their risk of developing heart disease by **25%–30%**.
- Secondhand smoke increases the risk for stroke by **20%–30%**.
- Secondhand smoke exposure causes more than **8,000** deaths from stroke annually.
- Breathing secondhand smoke can have immediate adverse effects on your blood and blood vessels, increasing the risk of having a heart attack.
- Breathing secondhand smoke interferes with the normal functioning of the heart, blood, and vascular systems in ways that increase the risk of having a heart attack.
- Even brief exposure to secondhand smoke can damage the lining of blood vessels and cause your blood platelets to become stickier. These changes can cause a deadly heart attack.

Over the past 25 years, public health initiatives have resulted in huge reductions in **secondhand smoke** exposure, which further lowers thrombotic heart attack and ischemic stroke risk.

These data help further explain why studies in *early* years showed reduced heart attack risk in aspirin users.

In today's relatively **secondhand-smoke-free** world, the potent anti-thrombotic effects of daily aspirin are not always going to show reduced heart attack risk because this major environmental threat has been largely eliminated.

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

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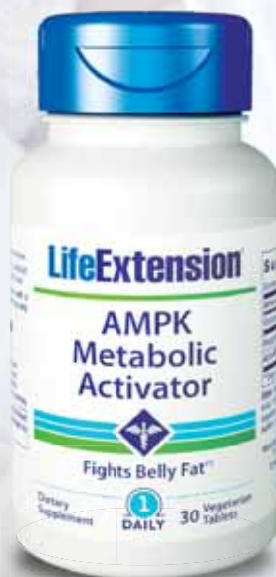
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Omega-3 Intake and Lower Risk of Mortality During 16 Years of Follow-Up

A study reported in the *Journal of Internal Medicine* reveals a lower risk of dying from any cause during a 16-year follow-up period among men and women who had a high intake of fish or omega-3 fatty acids.*

The investigation included 240,729 men and 180,580 women who were National Institutes of Health (NIH) and American Association of Retired Persons (AARP) enrollees in the NIH-AARP Diet and Health Study between 1995 and 1996. Questionnaires concerning lifestyle and diet were completed by the participants upon enrollment. Through 2011, 54,230 deaths occurred among the men, and 30,882 deaths occurred among the women.

For men whose intake of omega-3 fatty acids placed them among the highest **20%**, the risk of mortality from any cause was **11%** lower than the risk experienced by men whose intake was among the lowest **20%**. Similarly, women who were among the top **20%** of omega-3 consumers had a **10%** lower risk.

Editor's Note: When the risk of death from specific diseases was analyzed, men who had the highest intake of omega-3s experienced a **15%** lower risk of dying from cardiovascular disease, and for women in the top group, the risk was **18%** lower. Greater omega-3 fatty acid intake was significantly associated with a lower risk of mortality due to respiratory disease and Alzheimer's disease in men and women, and with a lower risk of chronic liver disease and cancer in men.

* *J Intern Med.* 2018 Oct;284(4):399-417.

Benefits from Quercetin, Dasatinib in Pulmonary Fibrosis

Results of a pilot study reported in *EBioMedicine* indicate benefits from the senolytic compounds quercetin and dasatinib in patients with idiopathic pulmonary fibrosis, a progressive disease that causes scarring of the lungs. Senolytics are compounds that target senescent, damaged cells, that resist destruction, and damage the cells that surround them.*

After finding positive results for treatment with the quercetin/dasatinib combination in a mouse model of idiopathic pulmonary fibrosis, researchers at the University of Texas Health San Antonio proceeded to evaluate the effects of the compounds in 14 older people. These individuals had been diagnosed with mild to moderate cases of the disease.

Participants received the senolytics for three consecutive days weekly, for three weeks. Blood chemistry, assays of senescence-associated proteins secreted by senescent cells, symptoms, and markers of physical function were assessed before and after treatment.

At the end of the trial, most of the participants showed mild improvement in physical function. The authors noted that “although statistically significant and clinically meaningful, [they] need to be verified in larger controlled trials.”

Editor’s Note: “No drug therapies, including the available antifibrotic drugs, have ever been shown to stabilize, let alone improve, an IPF (idiopathic pulmonary fibrosis) patient’s six-minute walk distance,” commented coauthor Anoop M. Nambiar, MD. “But in this pilot study of DQ (dasatinib/quercetin), participants’ six-minute walk distance improved an average of 21.5 meters (70.5 feet).”

* *EBioMedicine*. 2019 Jan 4;40:554–563.

Pomegranate, Berry Metabolite May Help Inflammatory Bowel Disease

A report published in *Nature Communications* suggests a benefit from urolithin A, a metabolite derived from pomegranate and berries, in the prevention and treatment of inflammatory bowel disease that includes Crohn's disease and ulcerative colitis.* These diseases are characterized by inflammation due to gut leakage of toxins.

In rodent studies, researchers found that administration of urolithin A, or its synthetic analog, protected against and reduced colonic inflammation in acute and chronic colitis.

A series of experiments demonstrated that these molecules decreased gut permeability by increasing the expression of tight junction proteins that are lost in inflammatory bowel disease.

Commented co-senior author, Dr. Praveen Vemula, of the Institute for Stem Cell Biology and Regenerative Medicine:

"Restoring the gut barrier and reducing the inflammation using a small molecule will provide a better therapeutic output in the treatment of IBDs (inflammatory bowel diseases)."

Editor's Note: "Urolithin A, a major microbial metabolite derived from polyphenolics of berries and pomegranate fruits displays anti-inflammatory, antioxidative, and anti-aging activities," the authors wrote. "Here, we show that urolithin A and its potent synthetic analog significantly enhance gut barrier function and inhibit unwarranted inflammation."

* *Nat Commun.* 2019 Jan 9;10(1):89.

Lower Risk of Multiple Sclerosis with Omega-3 Supplements

A study presented at the American Academy of Neurology's 70th Annual Meeting found a lower risk of multiple sclerosis among individuals who consumed daily **fish oil supplements**, in addition to eating fish **one to three times** per month, compared to those whose intake was low.*

The study included 1,153 subjects, among whom approximately one-half had been diagnosed with multiple sclerosis or clinically isolated syndrome (an initial multiple sclerosis episode lasting at least 24 hours). Reported intake of fish was defined as high among those who consumed **one to three** servings per month plus daily fish oil, or **one serving** of fish weekly. Low intake was characterized as **less than one serving** per month and no fish oil supplementation.

High consumption of fish and fish oil was associated with a **45%** lower risk of multiple sclerosis or clinically isolated syndrome, in comparison with a low intake.

Editor's Note: The researchers determined that two of 13 genetic variations in a human gene cluster that regulates fatty acid levels were associated with lower risk of multiple sclerosis.

* American Academy of Neurology's 70th Annual Meeting. 2018 April 21-27, Los Angeles.

Folate Intake May Need a Boost During Summer Months

The *Journal of Photochemistry and Photobiology B: Biology* published findings from researchers in Málaga, Spain of reductions in serum levels of the B vitamin folate in association with higher amounts of ultraviolet light exposure. “We have revealed that cycles repeat annually,” explained coauthor José Aguilera, of the University of Málaga. “The percentage of low values increases in summer.”*

Analysis of 118,831 serum blood samples collected from patients hospitalized in Málaga revealed a decrease in average folate values in all seasons compared to winter. Folate deficiency risk during summer was **37%** higher than the risk experienced during winter.

Subjects who had an initial folate measurement obtained during winter followed by a second test during summer were more than three times likelier to show the development of deficiency compared to those whose first test was during summer and second test was in winter.

Editor's Note: “A change in dietary habits –or the prescription of fortified food or supplements if dietary intervention is not effective– would help prevent folate deficiency,” the authors suggest.

* *J Photochem Photobiol B*. 2019 Jan;190:66-71.

Life Extension® Study Finds Intermittent Fasting Suppresses Holiday Weight Gain

Weight gain during the six-week period between Thanksgiving and New Year is a significant contributor to annual weight gain. If repeated every holiday season, this can result in cumulative weight increases over time. Obesity is a risk factor for numerous **chronic diseases** and an **increased risk of mortality**.

Life Extension conducted a study to determine if **intermittent fasting** could suppress harmful holiday weight gain.*

Published in the *Journal of Nutritional Science*, this pilot, randomized controlled study including 22 people, was conducted during the 52 days starting just prior to Thanksgiving and ending right after the New Year.

Ten people followed their regular diet and served as the control group, and 12 people participated in the **nutrition program** (which consisted of cycling between two **fasting days** followed by five days of their regular diet). The fasting days consisted of 730 calories per day of a balanced shake plus dietary supplements.

At the end of the 52 days, the control group did **not** experience a significant change in body weight, but they **did** experience harmful metabolic changes, including an increase in fasting insulin, LDL cholesterol, total cholesterol, and updated homeostasis model assessment (HOMA2), an indication of lower insulin sensitivity, which is suggestive of greater insulin resistance.

However, the nutritional program group experienced **significant weight loss**, a **13% increase in beneficial HDL cholesterol**, and a **22.8% decrease in triglycerides**. There were also significant differences between the two groups in changes in insulin levels, the total-to-HDL cholesterol ratio, and HOMA2.

These findings suggest that intermittent fasting could help **prevent weight gain** and **promote metabolic health** during the winter holiday season.

Editor's Note: Ingredients in the supplements in the nutrition program included EPA and DHA, sesame lignans, olive fruit and leaf extract, plant-based polyphenols, saturated fats, nuts, and olive extract (to mimic the Mediterranean diet), soluble fibers (*xylooligosaccharides*), Italian Borlotto variety of white kidney bean (*Phaseolus vulgaris*), saffron, clove bud and maqui berry extracts, curcumin, coenzyme Q10-ubiquinol and shilajit, *Gynostemma pentaphyllum* extract, and hesperidin.

* *J Nutr Sci*. 2019 Mar 25;8:e11.

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Fall Asleep *FASTER*
and
Stay Asleep *LONGER*



BY KATHERINE DE MATEO

The Centers for Disease Control and Prevention estimates that about **35%** of adults get less sleep than they should.¹

That's part of the reason sleeping pills are so popular. But they come with serious drawbacks, including risk for physical dependence, accidents, and eventual tolerance that renders them ineffective.

Several plant-derived extracts have been found to safely help promote healthy sleep.

Scientists have created a combination of three such extracts: **lemon balm**, **honokiol** (a compound found in the magnolia tree), and **apigenin** (an ingredient found in **chamomile**).

Together, they work on multiple sleep centers in the brain to help restore healthy sleep patterns.

One study of people with mild-to-moderate anxiety disorders and sleep disturbances showed **85%** of subjects that supplemented with **lemon balm extract** achieved full remission for insomnia and **70%** of the subjects had complete relief of anxiety symptoms.²

Preclinical and clinical studies and gene expression analysis show that these ingredients can help people fall asleep more easily *and* improve sleep quality, leading to restorative and health-promoting rest.²⁻⁵



The Problem with Sleeping Pills

Based on studies in sleep research, the CDC and other experts recommend that adults get *seven or more hours of sleep a night*.^{1,6}

Using this standard, they found that more than **1 in 3 adults** get suboptimal sleep on a regular basis. Frequently getting insufficient sleep has been linked to increased risk of obesity, depression, dementia, and chronic health issues like type II diabetes and heart disease.⁷⁻¹⁰

The failure to get enough sleep can be influenced by many factors, including caffeine consumption, stress, anxiety, and sleep disorders. The problem worsens with age, with around **40%** of all elderly adults suffering from some form of sleep complaint.^{11,12} Changes in hormones as we grow older have been linked to insomnia and poor sleep quality,^{13,14} and some medications prescribed to older individuals can disrupt sleep.¹⁵

Pharmaceutical sleep aids are extremely popular, but they come with an array of problems. One group of drugs, the **benzodiazepines**, works by enhancing the effect of a calming neurotransmitter called **gamma-aminobutyric acid (GABA)**. This causes reduction in anxiety, relaxation of muscles, and sedation. Common drugs in this class include **Valium®**, **Xanax®**, and **Klonopin®**.

But these drugs can cause too much sedation, leading to a “hangover” effect in the morning. Even worse, users can become addicted with regular use. And as doses increase, overdose becomes a possibility.¹⁶

Newer sleeping pills, such as **Ambien®** and **Lunesta®**, work by interacting with GABA receptors in the brain to produce sedative, anti-anxiety effects. Though they have a slightly lower risk for addiction, regular use can still lead to dependence. And many users of these drugs complain about a “zombie” effect the following day, which can cause poor mental performance, and risk for injuries such as falls.^{17,18}

The newest class of sleep aids, **orexin receptor antagonists**, takes a different approach than the above-mentioned drugs that enhance GABA signaling. The orexin system in the brain controls wakefulness. Therefore, orexin receptor antagonists enhance sleep. Users of orexin receptor antagonists are subject to a “hangover” effect and the potential for physical dependence, like they are with most potent sleep aids.¹⁹

A Healthier Alternative

Lemon balm is an herb in the mint family that enhances GABA neurotransmitter activity in the brain, but by a different mechanism than benzodiazepines and other sleeping pills. The compounds in lemon balm, including **rosmarinic acid**, have been found to inhibit the *enzyme* that normally degrades GABA.⁴ This keeps GABA levels *higher*, to support a sleep-promoting and anxiety-reducing effect.

The magnolia tree is the source of a compound called **honokiol**. Research has shown that honokiol interacts with the receptor for GABA. Through this interaction, it boosts the activity of GABA to aid sleep.⁵

The flowering herb **chamomile** has long been used as a natural sleep aid. Part of this effect may also be attributed to its GABA-enhancing activity. But chamomile and its active components, particularly the nutrient **apigenin**, may act by additional mechanisms to further promote sleep.²⁰

Computer-based gene expression analysis found that apigenin's profile resembles an **orexin receptor antagonist**, and therefore may be working in a similar fashion.³ Orexin, made in the wake centers of the brain, is a compound that promotes wakefulness. A *blocker* of orexin, which apigenin may be, reduces wakefulness and promotes sleep.^{21,22}

Medical Research on Herbal Sleep Aids

Scientists have uncovered evidence that lemon balm, honokiol, and chamomile can improve sleep.

Since they act by overlapping and unique mechanisms, a formulation combining all three can help restore healthy sleep patterns.

LEMON BALM EXTRACT

In one study, investigators recruited people with mild-to-moderate anxiety disorders and sleep disturbances.² Subjects were given a **lemon balm extract** for 15 days, then assessed by rating scales for anxiety and depression that included sleep quality.

At the end of the study, *all* the subjects were considered to have had a positive response to the supplementation, with **85%** seeing a **full remission of their insomnia** and the remaining **15%** being much improved.

In terms of anxiety symptoms, **70%** of subjects who responded to the product were considered in complete remission and another **25%** experienced significant improvement.

Another study of lemon balm evaluated patients with heart disease who had trouble sleeping, along with high levels of depression, anxiety, and stress.²³ These subjects were randomized to receive either a **lemon balm** supplement or a placebo for eight weeks.

The patients taking lemon balm had significantly reduced scores for depression, anxiety, and stress. They also took less time to fall asleep and had an increase in total sleep duration.

Promoting Restful Sleep

- It's estimated that more than **1 in 3** adults get inadequate sleep.
- Lack of sleep is associated with risk for many chronic diseases, including obesity, type II diabetes, heart disease, depression, and more.
- Medication used to induce sleep can lead to dependence and can have many potential side effects.
- Several plant-derived compounds have similar sleep-supporting effects, but without the worrisome side effects.
- A combination supplement of **lemon balm**, **honokiol**, and **chamomile** provides sleep-promoting effects to achieve a full night of restorative, health-protecting sleep.



Lemon Balm

HONOKIOL

In mouse models, **honokiol** reduced the time it took to fall asleep and increased the amount of sleep.²⁴ In another animal study, honokiol was directly compared to diazepam (Valium®).²⁵ It was found to reduce symptoms of anxiety to a similar level as the drug.

But while diazepam decreased muscle motor activity and tone, and impaired memory, honokiol did not. Mice experienced withdrawal symptoms when diazepam was stopped. The animals taking honokiol did not, indicating its use is not likely to lead to physical dependence.

CHAMOMILE EXTRACT

Chamomile is a popular herb often used as a tea to promote sleep and relaxation.²⁶

In a rat study, chamomile was shown to improve sleep onset and had a mild hypnotic effect (much like benzodiazepines).²⁷ In one clinical study, chamomile showed encouraging beneficial effects on daytime functioning in people with sleep problems.²⁸

Researchers believe that the active components present in chamomile, **apigenin** in particular, are responsible for its effects.



Insufficient Sleep Impacts Health

Lack of sleep isn't just an annoyance. It leads to serious problems for health and quality of life.

Inadequate sleep can have a harsh impact on **cognitive function**, causing slowed thinking, impaired attention, and inaccuracies that lead to loss of productivity during the day. It can also be downright dangerous. One study found that sleep deprivation led to poorer performance on cognitive and motor tasks comparable to a level of alcohol intoxication that would make it illegal to drive.²⁹

Another study found that construction workers suffering from poor sleep were at greater risk for **injuries** at the workplace.³⁰ And it's been estimated that as many as **6,000 deaths** due to car accidents *per year* have drowsy driving to blame.³¹

Sleep disorders affect long-term brain function as well. Repeated nights of inadequate sleep are associated with risk for **mild cognitive impairment** and **dementia**.¹¹

Studies have also linked suboptimal sleep to **obesity**.^{32,33} Lack of sleep was found to cause abnormalities in levels of the hormones **leptin** and **ghrelin**, which are critically important to normal body fat balance.³³ These abnormalities can contribute to weight gain and, eventually, obesity—which, in turn, increases the risk for many diseases.³⁴⁻³⁷

In fact, poor sleep quality has been implicated in risk for type II diabetes and heart disease.^{10,38} Even death from cancer appears more likely with inadequate sleep. One large study showed that patients with colorectal cancer who get less than five hours of sleep per day have a **54%** increase in cancer mortality, compared to those getting seven to eight hours of sleep.³⁹

All told, sleep can have a dramatic impact on mental and physical functioning and overall health.



Chamomile

Summary

Getting enough quality sleep is critical to health. Inadequate sleep increases risk for many chronic illnesses.

A large percentage of adults do not get enough sleep on a regular basis, and sleep problems increase with advancing age.

Many people rely on pharmaceutical drugs to aid sleep, but these medications cause several potential adverse effects, including risk for addiction and tolerance (which means they stop working).

A combination of plant-derived nutrients may provide support for healthy sleep, without the risk for significant side effects.

Lemon balm, honokiol, and chamomile (which contains **apigenin**) work on slumber centers in the brain to induce and maintain sleep, but without the sedating or addictive properties of those pharmaceutical medications. ●

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

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(References continue on the next page.)

New Tool in Drug Discovery

The newest frontier in drug discovery utilizes a *bioinformatics* approach called **connectivity mapping** to uncover previously unrecognized connections between compounds.

Whenever a compound or drug is applied to cells a unique **gene expression signature** is created. When two signatures are highly similar, this might represent useful and previously unrecognized connections between seemingly unrelated compounds.

This advanced tool, the **Connectivity Map** (CMap) library, was developed by the **Broad Institute** and is available for researchers to use.

Recently, scientists leveraged this tool to help identify natural compounds that produce a similar signature to an **orexin receptor antagonist**, a new class of sleep drugs. One such compound they identified was **apigenin**.

Although further investigation into this new potential mechanism is warranted, these interesting preliminary findings could help explain the complex nature of apigenin pharmacology in the brain.

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ENHANCED Male Sexual Health

BY MICHAEL DOWNEY

Mention **erectile dysfunction** and most people think of Viagra® and similar drugs.

These drugs work by relaxing the smooth muscles lining the arteries, that increases blood flow to the penis. They also come with some side effects.¹⁻⁴

Male sexual health is about more than an erection. It also includes interest, response, desire, and satisfaction.

Researchers have found a safer way to treat erectile dysfunction *and* improve overall sexual health: an extract of a **ginger-like root** called ***Kaempferia parviflora***.

Long used in South Asia to enhance male sexual function,⁵⁻⁷ this plant extract gently supports increased blood flow to the **penis** while *also* enhancing **brain responses** to sexual stimuli.⁸⁻¹²

A recently published study¹³ adds to previous evidence⁶ demonstrating its effectiveness. In the report, **improved erections** were noted by **61.5%** of participants.

Unlike pharmaceuticals, ***Kaempferia parviflora*** also improves **response time** to erotic stimuli and **intercourse satisfaction**. Noticeable results have been shown in as few as 30 days.^{6,13}

As a side-benefit, this **ginger-like extract** may also help protect against **arterial stiffening** throughout the body.

A Safe Alternative to Drugs

Erectile dysfunction drugs like Viagra®, Cialis®, and Levitra® work rapidly to enhance penile **blood flow**.

These **drugs**, however, come with some drawbacks:

- 1) They provide only temporary effects;
- 2) Cost up to \$50 a pill without insurance;
- 3) Function by only one mechanism;
- 4) Can cause side effects such as skin flushing, visual disturbances, hearing loss, and headache.¹⁴

And male sexual problems go beyond erectile dysfunction. Improved penile blood flow doesn't address other factors crucial for sexual satisfaction, like interest and desire.

That's why scientists view a **ginger-like root extract** called *Kaempferia parviflora* as a potential advance in male sexual health. It works on both the body *and* the brain to enhance the overall male sexual experience.

Studies show that taking this plant-based ingredient can result in *improvements* in response time, and in intercourse satisfaction, in addition to erectile function. And *Kaempferia* achieves this overall sexual improvement in a **sustainable** and **safe** way.^{6,13}

Improved Overall Sexual Health

A human study recently published in the *Journal of Integrative Medicine* shows the benefits of *Kaempferia parviflora*.

Scientists enlisted 14 healthy, sexually active men who had self-reported, mild erectile dysfunction. None were using any prescription treatments for this condition.¹³

Each volunteer took one capsule containing **100 mg** of *Kaempferia* extract once daily for 30 days. The extract was standardized to **5%** of the active compound, **5,7-dimethoxyflavone (5,7-DMF)**. The active 5,7-DMF compound has been shown in lab studies to be instrumental in how this extract works.⁹

The investigators employed the **International Index of Erectile Function (IIEF)** questionnaire, a validated 15-item survey used to assess the severity of erectile dysfunction.^{15,16}

The 13 men who completed the study were an average age of 58. According to the IIEF questionnaire, **improved erections** were reported by **61.5%** of participants. And the average score for the question, "When you attempted intercourse, how often were you able to penetrate your partner?" increased by an average of **12.5%**.¹³

There was another compelling finding that goes beyond erectile function.

Participants also reported a mean increase of **13% in intercourse satisfaction**. And they reported improvements in their *overall* sexual health.¹³

There were no meaningful changes in blood pressure or in an array of other measures, ranging from cholesterol and blood glucose to testosterone and body weight.¹³

The positive results and lack of harsh side effects make this root extract a new option for men interested in enhancing sexual function.



Additional Research

An earlier clinical trial in aging men found that *Kaempferia parviflora* enhances the overall male sexual experience.⁶

The study assigned 45 men, with an average age of 65, into one of three groups. One group took a placebo, one took **25 mg** of *Kaempferia* extract, and the third took **90 mg** of this extract for eight weeks.⁶

Compared to the placebo group, those taking the **90 mg** dose had a **quicker erectile response** to visual erotic stimuli. Elapsed time between stimulus and full erection was cut by **50%**, from 10 minutes to just five. Those taking **25 mg** of the extract did not experience a statistically significant reduction in response times, suggesting that the dose was not sufficient.⁶

Men taking **90 mg** of the extract also experienced about **one-centimeter greater penile length**, both when flaccid and erect. Within one month, their penile circumference (girth) also increased by as much as **1-1.5 centimeters** (about half an inch), which was largely sustained at two months.⁶

Again, this study found no significant changes in testosterone or other hormones, or any other indicators of safety problems.⁶

Together, these clinical studies provide evidence that *Kaempferia* extract can safely improve erectile dysfunction *and* boost overall sexual health and interest over a sustained period.^{6,13}

How It Works

Laboratory and animal studies have identified two main mechanisms through which *Kaempferia parviflora* improves sexual health in men.

The first mechanism seems to involve the activation of **brain responses to sexual stimuli**. Studies on rats showed that in addition to enhancing blood flow to the genitals, *Kaempferia* extract improved sexual motivation and increased sexual behavior.^{7,8,17} In other words, this extract appears to increase the overall *desire* to engage in sex, once presented with sensory stimulation. This is an action unique to *Kaempferia* that is not a feature of erectile dysfunction drugs.

The second mechanism improves **arterial and endothelial** (blood vessel lining) **function** throughout the body. These improvements have a particularly important impact on the penis, a highly sensitive recipient of blood flow. This is what produces the clinical effects of improved erectile response times and increased size of the penis.^{6,13}

Similar to erectile dysfunction drugs, this extract was also shown to inhibit the enzyme **PDE5**,⁹ which normally sends a signal to reduce blood flow through the arteries in the penis, causing an erection to diminish.¹²



Ginger-like Extract Enhances Sexual Function

- Although erectile dysfunction is often treated with drugs such as Viagra®, male sexual health goes well beyond erectile function.
- A ginger-like root extract, *Kaempferia parviflora*, gently supports blood flow to the penis while also enhancing response time to sexual stimuli, and intercourse satisfaction, with results seen in as little as 30 days.
- Erectile dysfunction is also a useful indicator of vascular (blood vessel) and endothelial (blood vessel lining) problems. In other words, it is one of the earliest symptoms of cardiovascular disease.
- Studies show that, by allowing arteries to relax and offer minimum resistance to blood flow, *Kaempferia* may provide protection against multiple types of cardiovascular disease.

Broader Cardiovascular Benefits

Kaempferia parviflora isn't just safe. It also appears to deliver body-wide **cardiovascular protection**.

Erectile dysfunction is an important early warning sign for underlying **cardiovascular disease**, because it is an indicator of the functioning of **vascular** (blood vessel) and **endothelial** (blood vessel lining) processes.^{18,19}

Studies show that men with erectile dysfunction have a higher risk of cardiovascular disease and are more likely to die prematurely compared to men who have normal erectile function. This is regardless of age and other cardiovascular factors.^{18,20}

Nitric oxide deficit, which is a major cause of endothelial dysfunction, often shows up first as erectile dysfunction. But it can also be an indicator of vascular disorders that may result in heart attack or stroke.²¹⁻²⁵

Aside from the sexual benefits already discussed, *Kaempferia* exerts **broader arterial benefits** by promoting the *production* of **nitric oxide**, which helps relax arteries everywhere in the body. In addition to easing erectile dysfunction, this action shows promise in preventing multiple types of vascular-related diseases.^{10-13,26}

An animal study demonstrated the beneficial effects of *Kaempferia* extract in the **heart**. In isolated portions of rat aorta, the active component of *Kaempferia*, **5,7-DMF**, triggered significant relaxation, which produced a larger space through which blood could flow. These shifts were traced, in part, to higher levels of *nitric oxide* and cyclic GMP, intracellular signaling molecules that tell arterial muscles to relax.¹⁰



These findings show that by allowing arteries to relax and offer less resistance to blood, *Kaempferia* extract can benefit **systemic vascular health** while it improves male sexual health.

Summary

Many aging men with **erectile dysfunction** are prescribed costly drugs that can cause side effects.

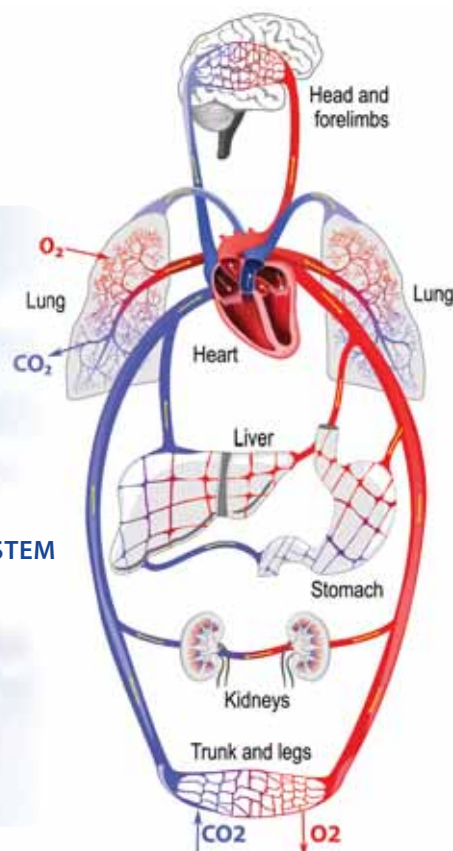
Research shows that a ginger-like root extract called *Kaempferia parviflora* leads to improvements in **erectile function**, boosts **response time** and **inter-course satisfaction**. Studies show enhanced overall sexual health in men improving in as little as 30 days.

Kaempferia increases levels of *nitric oxide*, which relaxes blood vessels and enables efficient blood flow. This is critical for both healthy male sexual function and overall blood vessel health.

Studies show that this extract also demonstrates promise beyond sexual health. By relaxing arteries throughout the body, this extract can help maintain systemic vascular health. ●

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

HUMAN CIRCULATORY SYSTEM





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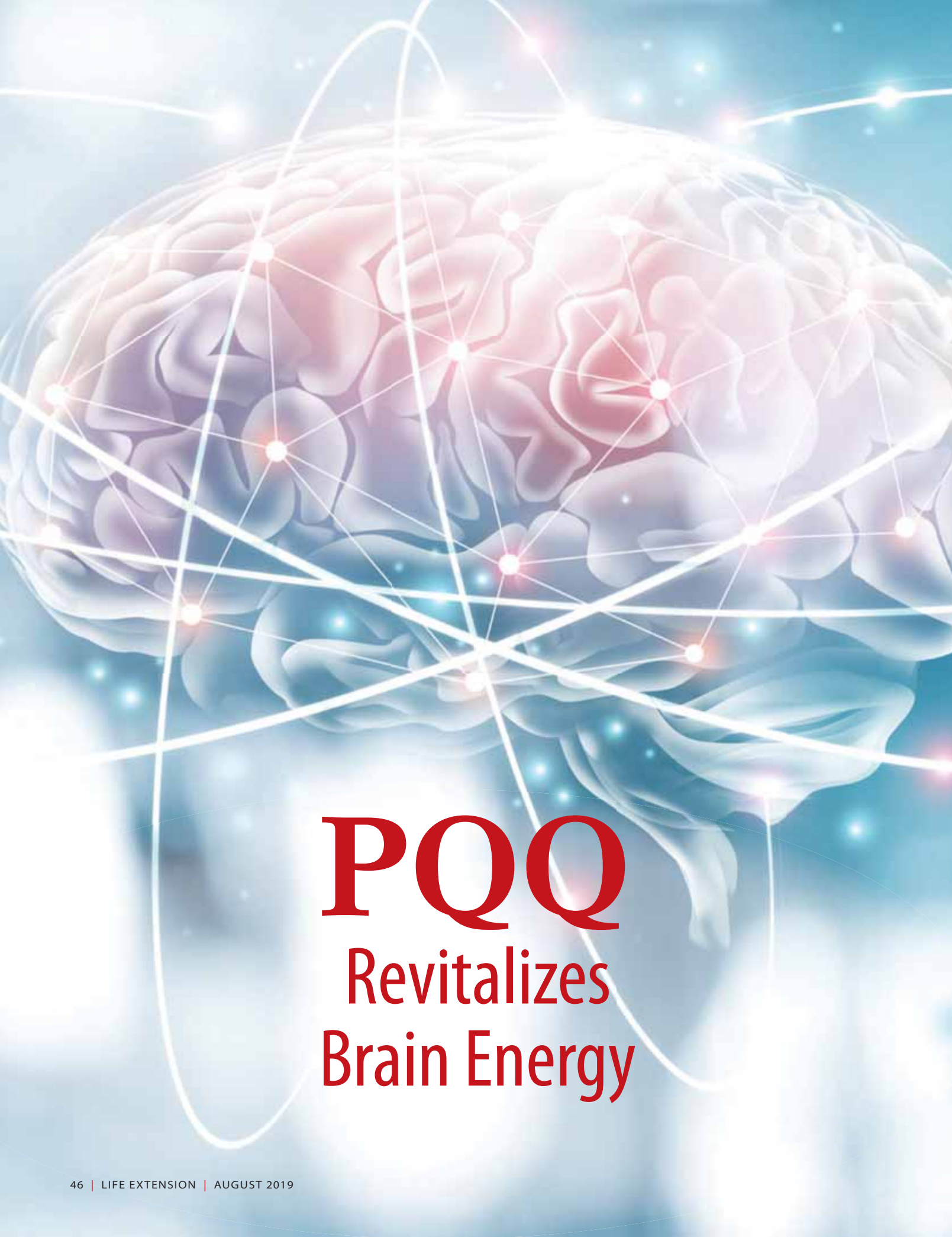
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PQQ

Revitalizes
Brain Energy



BY KATHY HONEM

Scientists have documented that **PQQ** helps grow new **mitochondria** in aging cells.

This is important because over time, cell energy diminishes as mitochondria weaken and die. The result is accelerated **aging** throughout the body.¹⁻³

PQQ facilitates production of new **mitochondria**,⁴⁻⁷ and helps **energize** existing mitochondria.

As research continues, PQQ promises to play a key role in the fight against the ravages of aging. Studies show that it restores youthful function and, in animal studies, enhances lifespan.^{8,9}

Of significance to maturing individuals is the ability of **PQQ** to protect the **brain** from **traumatic** injury and **stroke-induced** damage, in addition to its systemic **anti-aging** properties.

PQQ is a vitamin-like compound essential for cellular **energy** functions.

Mitochondria and Aging

Mitochondria act like tiny power plants. They take digested nutrients and convert them into energizing compounds that cells use to do their work.

Most cellular functions rely on a constant supply of energy from mitochondria for essential activity such as growth, repair, and reproduction.

During our lifetime, mitochondria divide on their own to replenish their numbers—a remarkable process known as **mitochondrial biogenesis**. But with advancing age, this process slows.

Mitochondrial biogenesis is critical to protect cells from premature aging.^{2,3} As we get older and mitochondrial function diminishes, many health problems manifest, including **neurodegeneration**.¹⁻³

But mitochondria *can* continue to grow, repair, and replenish themselves even in later life. They just need a boost—and that's where **PQQ** comes in.

PQQ Boosts Mitochondrial Biogenesis

PQQ serves as a *cofactor* for several energy-generating reactions in the mitochondria.¹⁰ Animals raised without any intake of PQQ display many abnormalities of growth and development.¹¹

New research confirms that PQQ is a powerful stimulator of **mitochondrial biogenesis**.⁴⁻⁷

A study evaluated the effect of a single dose of PQQ in **human** subjects.¹² Each participant was given **0.3 mg of PQQ per kilogram of body weight**, which amounts to approximately **20 mg** for an average person.

Within 48 hours of supplementation there was a definitive *increase* in **mitochondrial function** as measured by metabolites in the urine.

A side benefit to this single **20 mg** dose of PQQ: Markers of **inflammation**, including **C-reactive protein** and **interleukin-6**, *decreased*, showing evidence that PQQ also has an anti-inflammatory effect that could help ward off a variety of ailments.

Healthy Brain Aging

The **brain** is one of the most metabolically active organs in the body. Because of PQQ's ability to stimulate mitochondrial growth, researchers believed that it should have beneficial effects for cognition and brain health.

Mitochondrial biogenesis has been identified as key in protecting against neurodegeneration and cognitive decline.^{13,14}

In one study, 41 healthy, elderly subjects were randomized to receive either **20 mg** of **PQQ** daily for 12 weeks or a placebo. Compared to the placebo,

supplementation with PQQ was associated with **significant improvements** in attention and working memory, and an associated increase in brain blood flow in the frontal lobes.¹⁴

In elderly people with forgetfulness (either self-identified or identified by a family member or acquaintance), the same PQQ dose led to **improvements in memory-test scores** after eight weeks.¹⁵

Researchers have also found evidence that PQQ may slow the progression of serious neurodegenerative disorders, including Alzheimer's and Parkinson's—or even prevent them altogether.¹⁶⁻²² That's because, in addition to boosting mitochondrial function, PQQ has been found to *prevent* the accumulation of abnormal proteins (such as **beta-amyloid** and **alpha-synuclein**) associated with these diseases.¹⁶⁻¹⁸

Moreover, PQQ protects against the toxic effects of these abnormal proteins that damage brain function. For example, cells exposed to *amyloid* normally display oxidative stress and **cell death**. In one study, treatment with PQQ dramatically *reversed* these effects, helping to keep brain cells viable and healthy.²² This indicates remarkable potential for PQQ to halt the development of various kinds of dementia.





PQQ and Recovery from Traumatic Injury

The ability of PQQ to protect and keep cells healthy, even in the face of damage, has led to explorations of PQQ as a neuroprotective compound in cases of **traumatic injury**.

In experimental rodent models of traumatic brain injury, treatment with PQQ successfully **prevented cell death**.^{23,24} It did this by preventing the activation of *caspases*, which are proteins associated with pathways that lead to cell death. This protective effect is linked to improved brain function and cognitive performance—that are otherwise significantly reduced after head injury.

These neuroprotective effects also extend to the peripheral nervous system, that connects the brain and spinal cord to the limbs and organs. The regeneration of peripheral nerves that have been severed is enhanced by treatment with PQQ.²⁵⁻²⁸

This important finding has led to the development of nerve repair conduits that are filled with PQQ. The aim is for surgeons to use these in nerve reconstruction procedures to help maximize recovery following nerve injuries.^{25,27,28}

Head trauma is a major problem for maturing individuals at greater risk for falls. PQQ may protect against excessive damage if one sustains a head injury.

The Benefits of PQQ

- Pyrroloquinoline quinone (PQQ) is a vitamin-like compound that many scientists believe should be categorized as an essential nutrient.
- In addition to PQQ being a required cofactor for some enzymes, it is one of the most powerful compounds discovered to stimulate mitochondrial biogenesis.
- Rejuvenating cells through mitochondrial biogenesis improves health and protects cells from age-related loss of function, and from disease.
- In tissues like the brain, with high energy requirements, PQQ can boost function and may prevent the progression of neurodegenerative disorders such as Alzheimer's and Parkinson's disease.
- PQQ is not produced in the body, so boosting its levels requires increased oral intake. Most human studies of PQQ have utilized doses of around 20 mg per day.

PQQ and Stroke

Stroke remains a leading cause of paralysis, memory loss, nursing home confinement, and premature death.

Emergency medicine technologies such as **clot-dissolving** drug therapy (tissue plasminogen activator or tPA) are sparing numerous stroke victims from permanent paralysis.

More advanced approaches, such as **endovascular thrombectomy** (mechanical clot retrieval from occluded cerebral artery), are enabling more stroke victims to avoid paralysis. Thrombectomy has been shown effective up to 24 hours *after* onset of ischemic stroke symptoms.

PQQ can also play a role in further protecting the brain from the devastation of a stroke.

In lab studies, PQQ reduced ischemic damage, potentially improving the quality of life following a stroke.

This was demonstrated in an animal model of ischemic stroke. When PQQ supplementation was given *before* ischemia was induced, it significantly reduced the size of the damaged brain tissue region.

Surprisingly, PQQ had a similar protective effect even when it was administered *after* the ischemia was induced.²⁹

Another study showed similar neuroprotective effects. It also showed that PQQ led to significantly improved neurobehavioral scores after the stroke.³⁰ These findings are tremendously exciting for those working in the area of human stroke prevention and treatment. The implication is that stroke patients could be given PQQ in the emergency room to reduce paralyzing brain damage.

PQQ Extends Lifespan

The way PQQ boosts mitochondrial growth turns out to have extraordinary side benefits.⁶

Supplementation with PQQ *turns on* a gene expression pathway regulated by *PGC-1α*, a well-known activator of **mitochondrial biogenesis**.

It appears to achieve this through activation of **SIRT1**, a **sirtuin** protein. Numerous recent studies have shown that sirtuins help regulate cellular health, protect against disease and age-related loss of function, and play a role in boosting longevity.^{6,31-38}

In other words, not only does PQQ trigger mitochondrial biogenesis, it also *activates* and *supports* many **other protective mechanisms** tied to lifespan extension and health.

In addition to all these effects, PQQ mops up damaging free radicals. Many other nutrients can only quell oxidative stress for a short period of time.

For example, **vitamin C** can only participate in about four cycles of beneficial **redox cycling**. In comparison, one molecule of PQQ can undergo an astonishing **20,000** cycles!^{10,39}

As a result of all these abilities, PQQ has shown it can increase lifespan. A type of roundworm, *C. elegans*, is an animal model commonly used to study longevity, due to its relatively short lifespan. Two different research groups have used this model to evaluate PQQ's life-extension effects.^{8,9}

In both studies, supplementation with PQQ led to a **significant increase in the average lifespan** of treated animals. In fact, the studies' findings were almost identical, with an average increase in lifespan by **30%** in one study and **31%** in the other.

Dr. Bruce N. Ames is a widely respected professor emeritus of biochemistry at the University of California at Berkeley, who has also worked for the National Institutes of Health. Dr. Ames writes frequently about nutrients that prolong life and improve health.

From Space Dust?

PQQ is synthesized in some of the Earth's simplest and oldest organisms, such as soil bacteria. That has led scientists to believe it may be central to the very formation and existence of life on this planet.

This viewpoint is supported by fascinating findings from outer space. Researchers recently analyzed the chemical makeup of dust from a comet's tail. They found evidence that PQQ is contained in this material.^{40,41}

This startling discovery has led to speculation that the Earth may have been seeded with PQQ from space, contributing to the development of early life.



Dr. Ames puts PQQ on his shortlist of “longevity vitamins,”⁸ based on its ability to stimulate **mitochondrial biogenesis**. He maintains that optimal levels of **PQQ**, along with a handful of other compounds (like CoQ10), are “necessary for promoting healthy aging.”

Summary

Scientists and physicians are just beginning to recognize the importance of **pyrroloquinoline quinone (PQQ)**. Compelling evidence shows this nutrient is crucial for healthy cellular functions.

Through its ability to activate **mitochondrial biogenesis**, PQQ supports healthy aging, and helps protect cells from damage that contributes to loss of function in older age.

Increased intake of PQQ has demonstrated the ability to augment healthy brain function and may prevent age-related loss of cognitive function, including dementia due to stroke or Alzheimer’s disease.

Because PQQ is not produced in the body, it must be acquired from the diet or through supplementation. To date, human studies have generally utilized doses of approximately **20 mg** of PQQ daily. ●

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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Lutein and Zeaxanthin Boost Brain Power

BY JONATHAN CHASEN

Recent studies have shown that **lutein** and **zeaxanthin**, well known for protecting the eyes, also boost factors involved in **brain function** and cognitive performance.

The effects of these **plant-based** nutrients have been shown in young people *and* older adults—even those with early cognitive impairment.¹⁻⁵

What most people don't realize is there is a connection between the eyes and brain.

When doctors examine the **retina** and **optic nerve**, they are looking at **brain cells**.

That's why it makes sense that the nutrients **lutein** and **zeaxanthin** nourish the brain as well as the eyes.⁴

Levels of **lutein** and **zeaxanthin** in the **retina** correlate with their levels in brain tissue.^{4,6,7}

Multiple studies reveal that people with higher **macular levels** (central portion of the retina) of **lutein** and **zeaxanthin** have better **brain function** and **cognitive performance** than those with lower levels.^{6,8-12}

Lutein and zeaxanthin are demonstrating beneficial impacts on brain processing speeds, visual memory, cognitive flexibility, and improved brain blood flow.

Enhanced Brain Function

Neurological function relies on the ability of the brain to accurately process signals and carry out processing tasks.

Brain function can be measured by **functional MRI (fMRI)** scans, which reveal which brain areas are active during specific cognitive tasks.

A **2017** study using **fMRI** showed that people with *higher* macular **lutein** and **zeaxanthin** levels had greater **neural efficiency** on a test of learning and memory.⁹

A **2019** follow-up study showed that those improvements in brain efficiency occurred specifically in areas associated with:¹²

- **Visual-spatial perception** (Where is the object I'm looking at?),
- **Processing** (What is that object?),
- **Decision making** (Should I approach or avoid the object?),
- **Motor coordination** (Grasp the object or run away from it).

These findings suggest that the brains of people with *higher* **lutein** and **zeaxanthin** are better at distinguishing important **signals** from unimportant or irrelevant background “noise.”

This was further supported by a study of **auditory** signaling, which showed that people with higher levels of these plant pigments (lutein and zeaxanthin) could detect true **sound** signals more efficiently than those with lower levels.¹⁰

Brain Function Improvements

Two recent studies conducted at the **University of Georgia** demonstrate that **brain function** is *improved* by daily supplementation with **10 mg of lutein** and **2 mg of zeaxanthin**.^{1,5}

In the first study, healthy *older* adults (with a mean age of 72) were randomly assigned to receive supplements containing lutein and zeaxanthin or a placebo. Over the course of a year, the ability to learn and recall word pairs deteriorated in the placebo group, but *not* in supplemented participants.

Functional MRI scans taken during the task showed this benefit was produced by **enhanced brain blood flow** in the **lutein** and **zeaxanthin** supplemented group.¹

The second study measured **brain cell activation** in people receiving a placebo or **10 mg/day** of lutein and **2 mg/day** of zeaxanthin.⁵

At baseline, subjects with *lower* macular pigment levels had *lower-powered visual signals* from their brain cells, compared to those with *higher* levels of lutein and zeaxanthin.⁵

After a year of supplementation, *visual signal power was significantly improved*, providing subjects' brains with a stronger signal-to-noise ratio.⁵

Improved Cognitive Performance

Cognitive performance refers to more advanced tasks involving memory, reasoning, and thinking, and it is measured by tests of cognition.

Higher macular **lutein** and **zeaxanthin** levels have been associated with improvement in:^{6,8,11}

- **Overall cognition,**
- **Verbal learning and fluency,**
- **Recall,**
- **Processing and perceptual speed,**
- **Memory,**
- **Executive function** (Information sorting, prioritizing, and taking action).

Two additional studies from the **University of Georgia** show that supplementing with lutein



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and zeaxanthin can support **better cognitive functioning** in both young and old populations.^{2,3}

In a group of healthy **young adults** (ages 18-30), subjects received daily doses of **10 mg** lutein and **2 mg** zeaxanthin or a placebo. Macular pigment measurements and cognitive testing were performed at the start and then every four months for a year.³

Supplementation increased macular levels of the pigments significantly, and this increase resulted in substantial improvements in:³

- **Spatial memory** (Where did I leave that book?),
- **Reasoning ability** (Where might I have left the book?), and
- **Complex attention** (Why am I reading the book anyway?).

Using the same study design and dosages, the second trial evaluated lutein and zeaxanthin supplementation in **older adults** (with a mean age of 73).²

Macular levels of lutein and zeaxanthin increased significantly in supplemented subjects, and this change was accompanied by

improvements in **complex attention** and **cognitive flexibility** (the ability to hold conflicting facts in one's mind at the same time, which is crucial in making complicated decisions).²

Men in the study also showed improvement in **composite memory** (verbal and visual memory) when supplemented.

Summary

Lutein and **zeaxanthin** are carotenoid pigments that have long been known to help improve retinal health and preserve vision.

New studies have now shown that people who supplement with **10 mg/day** of lutein and **2 mg/day** of zeaxanthin see significant improvements in **brain function**, including enhanced **brain blood flow** and **neural efficiency**.

That translates into improved **cognitive performance** in tasks related to thinking, learning, discerning, and judging—all elements of **youthful brain behavior**. ●

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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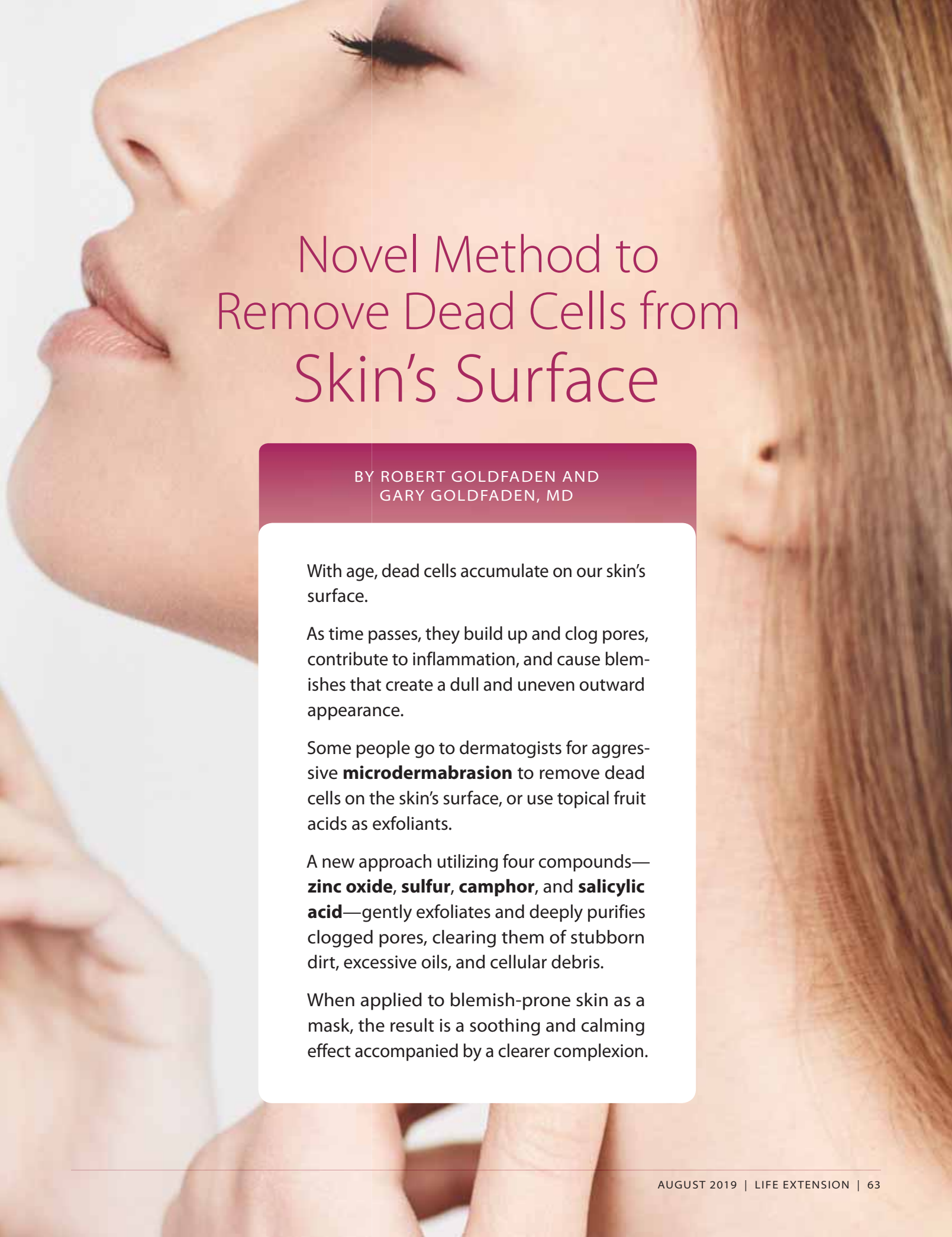
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Novel Method to Remove Dead Cells from Skin's Surface

BY ROBERT GOLDFADEN AND
GARY GOLDFADEN, MD

With age, dead cells accumulate on our skin's surface.

As time passes, they build up and clog pores, contribute to inflammation, and cause blemishes that create a dull and uneven outward appearance.

Some people go to dermatologists for aggressive **microdermabrasion** to remove dead cells on the skin's surface, or use topical fruit acids as exfoliants.

A new approach utilizing four compounds—**zinc oxide, sulfur, camphor, and salicylic acid**—gently exfoliates and deeply purifies clogged pores, clearing them of stubborn dirt, excessive oils, and cellular debris.

When applied to blemish-prone skin as a mask, the result is a soothing and calming effect accompanied by a clearer complexion.

Concept of Skin Detoxification

Every day, our skin is exposed to environmental toxins like soot, exhaust fumes, and cigarette smoke. When you factor in the increased use of cosmetics with synthetic chemicals, our skin is absorbing toxins at an alarming rate that overloads its own detoxification system.

As toxins accumulate, the skin begins to lose its youthful, vibrant glow and becomes dull and lifeless. Toxic buildup imposes an unfavorable environment of inflammation and oxidative stress in the skin that impairs cellular rejuvenation, forms blemishes like blackheads, and clogs tiny hair follicle openings, known as pores. This is noteworthy since clean and healthy pores produce an oily substance called sebum that protects, softens, and moisturizes the surface of the skin.¹⁻³

Chronic sun exposure can exacerbate clogged pores. Ultraviolet rays also accelerate the breakdown of the structural proteins collagen and elastin, causing pores to lose elasticity and become enlarged.^{4,5} This provides more areas for additional debris such as dust, dirt, and pollen to accumulate.

Researchers have zeroed in on four compounds that exhibit *exfoliating* and *detoxifying* actions to remove deeply embedded impurities trapped in clogged pores, resulting in improved skin appearance.

Zinc Oxide

Zinc oxide is a mineral well-known for its role as an essential component of **superoxide dismutase**—an *enzyme* that combats oxidative stress in the skin to diminish swelling, calm visible redness, and ease inflammation associated with clogged pores.⁶⁻⁸ By exerting antioxidant and anti-inflammatory effects, zinc oxide protects and repairs the structural integrity of the skin from sun damage, preventing and healing blemishes.^{9,10}

Other research indicates that zinc oxide suppresses excess production of sebum by reducing the activity of sebaceous glands, thereby helping to eliminate oily skin and minimize the appearance of facial pores.¹¹

Sulfur

Sulfur can help in exfoliation by acting on keratinocytes on the outer layer of the skin.^{12,13}

This interaction helps shed the dull, devitalized skin cells from the surface, to reveal newer, smoother skin underneath.^{12,14}

By sloughing off these dead skin cells, the sulfur decongests clogged pores and significantly reduces their size, to improve the tone and texture of your skin.





Facial Mask Reveals Rejuvenated Complexion

- Accumulation of dead cells and impurities on the skin's surface combines with excess sebum (oil) to cause clogged pores, inflammation, and unsightly blemishes like blackheads.
- Environmental stressors such as sun exposure stimulate excess sebum output that enlarges facial pore size.
- Zinc oxide eases inflammation, thereby healing blemishes and calming redness associated with clogged pores, as well as suppressing sebum production to help eliminate oily skin.
- Sulfur exhibits exfoliating properties that decongest clogged pores, reducing their size, to improve the tone and texture of the skin.
- Camphor significantly increases blood flow to skin to aid in the removal of deeply embedded impurities and toxins, while enhancing the delivery of beneficial nutrients like zinc oxide and sulfur.
- Salicylic acid exfoliates the outer layer of the skin, clearing the buildup of dead cells and impurities.
- These compounds have been formulated in a newly designed detox facial mask with a pleasant mint-like smell. When applied to flawed skin, it leaves a smoother, cleaner, and rejuvenated complexion.

Camphor

Camphor is derived from the wood of the camphor tree.

It has been used for centuries in traditional medicine for its strong anti-microbial, anti-viral, and anti-nociceptive properties.^{15,16}

When topically applied to the skin, camphor improves blood flow, which may enhance the delivery of vital nutrients like zinc oxide and sulfur, while removing toxins and extracting difficult-to-reach impurities to cleanse clogged pores.¹⁷ Additionally, camphor induces a cool, soothing sensation that makes for an ideal feeling after exfoliation.

Salicylic Acid

Salicylic acid is a safe and effective ingredient used to treat various skin conditions. Its ability to exfoliate the outer layer of the skin makes it a good peeling agent.¹⁸ Applied topically, it clears the buildup of dead cells and impurities, leaving you with a more radiant complexion.



Summary

Impurities and dead cells accumulate on the skin's surface despite our best efforts to remove all of them. They combine with excess oils and air pollutants to deeply clog pores and create a flawed complexion marked by unsightly blemishes.

A nutrient-rich detox facial mask with a pleasant mint-like scent has been formulated with zinc oxide, sulfur, camphor, and salicylic acid to gently exfoliate the skin, regulate oil production, and deeply cleanse clogged pores to leave a smoother, cleaner, and rejuvenated complexion. ●

Gary Goldfaden, MD, is a clinical dermatologist and lifetime member of the American Academy of Dermatology. He is the founder of Academy Dermatology in Hollywood, FL, and Cosmesis Skin Care. Dr. Goldfaden is a member of the **Life Extension®** Medical Advisory Board. All Cosmesis products are available online.

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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- **Sulfur** promotes normal turnover of skin cells.
- **Camphor** boosts healthy blood flow to skin and supports delivery of zinc oxide and sulfur deep into skin cells.
- **Salicylic acid** supports clear skin and promotes normal turnover of skin cells.

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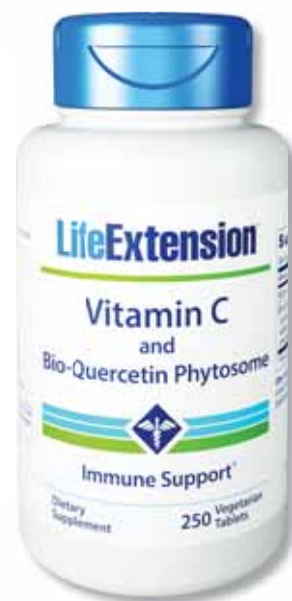
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Wendy Ida

It's Never Too Late to Take Back Your Life!

BY LAURIE MATHENA

Wendy Ida isn't your average 67-year-old.

She holds eight Bodybuilding Championships. She has set two fitness-related Guinness World Records.

And she's become a social media influencer with about 94,000 followers.

But the most remarkable part of her resume? Ida (pronounced ee-da) didn't begin her fitness journey until she was 43 years old.

Since then, she's reinvented herself and is now a best-selling author, motivational speaker, fitness coach, and life coach. Ida is a life reinvention strategist, coaching people on how to transform their lives and their bodies.

But while she now spends her days spreading the message that *it's never too late to take back your life*, Ida first had to go through the process of taking back her own life.

Take Back Your Life

Wendy Ida's goals weren't always fitness-minded. At one point, her only goal was to save her own life—and the lives of her children.

Married at the age of 19, Ida soon found herself in a physically abusive relationship where she almost lost her life on several occasions. It took 13 years and three attempts to get away before Ida was able to make her escape.

She packed up her two young children and drove all the way from New Jersey to California.

"I left everything I owned and left with my two babies and just the clothes on our backs, and we ran," said Ida. "I had to start over."

Little did Ida know that she wasn't just starting over. She was starting on a journey that would transform her life as well as the lives of thousands of others.

Reinventing Herself

At the age of 43, Ida was making a new life in Los Angeles as an accountant. But even though she had escaped an abusive relationship, she still had not outrun the demons that haunted her.

She was unhealthy, overweight, and scared of her own shadow.

"I was settled with the old way of thinking. My parents and aunts and uncles were all overweight, and I just thought it was going to be my destiny as well," she said. "I was in my 40s and I thought life was over."

All of that changed when she joined her local gym and met the person she calls her "Earth Angel," her fitness coach, Jim Kelly.

"It literally changed my life, it changed my mind, it changed my body, and it changed my career.



It led me down the path of the reason why I was put on this earth," said Ida. "Prior to that, I was just going through the motions of life."

Kelly pushed her to realize her full potential.

Ida lost 80 pounds and transformed the way she looked. Yet the true transformation came, not from her physical appearance, but from what was happening on the inside.

"When my body started changing, my mind started changing too. I got some clarity," Ida said. "It cleared the cobwebs in my mind and gave me a path."

Over the next several years, Ida quit her job as an accountant, got certified as a trainer, learned as much as she could about nutrition, and became a life coach and trauma coach. She also remarried.

In 2011, she wrote a best-selling book based on her life's journey called *Take Back Your Life: My No-Nonsense Approach to Health, Fitness, and Looking Good Naked*.

Today she travels the country as a motivational speaker, giving people the tools necessary to do what she did—take back their lives.

Setting Goals

Ida's number one message to people?

It's never too late.

And she, herself, is living proof.

Ida competed in her first bodybuilding competition at age 57. She has since won eight National Champion trophy awards in the National Physique Committee Bodybuilding and Figure Championships.

At age 60, she set two **Guinness World Records**. One was for the **Most Burpees in One Minute**. Ida did 37. (To do a burpee, also called a squat thrust, you begin in a standing position, squat down with your hands on the ground, kick your feet back to a plank

position, jump back forward into a squat, and then stand up—that counts as one burpee.)

The second Guinness World Record was for being the **Oldest Active Instructor** in multiple disciplines. And she's not finished yet. Ida constantly sets new goals for herself.

"Goals are what keep me excited about life. Making a goal brought me out of depression. I got focused, I was driven, and I had something to live for," said Ida. "When I accomplish one goal, I'm always working on the next. It gives me energy."

And for her next goal? "For my next goal, I want to be – I'm going to be – the first senior on a *Sports Illustrated Magazine* cover." As Ida continues to set her own goals, she is also helping people—especially women—accomplish their own.

It All Starts in the Mind

Ida's no-nonsense approach to health and fitness has earned her the reputation of being "America's #1 expert on living fit, fierce, and fabulous after 40."

Ida's book, *Take Back Your Life*, speaks directly to women over 40 who feel like their lives have spun out of control after the physical and emotional changes that occur during midlife. It's a holistic, action-oriented, 90-day guidebook for women who want to take back control of their lives.

Ida focuses on helping people over 40 because, as she says, "They are me."

"At 40 is when all the challenges start coming. Everything you did before 40 all starts coming together. It's when the chickens come home to roost," said Ida. "In addition to the natural changes that automatically happen in the aging process,

the decisions you've made in life come together and create energy losses and mental challenges, and they are literally making people depressed."

So when people tell her they're too old or too sick or too *anything* to start living their best life, Ida points to her own life as living proof that *it's never too late*.

"In order to encourage people to take back their life, I try to encourage them to think differently," said Ida. "You have to change your mindset. Having the knowledge is one part, but you also have to have the tools to go forward. You have to be willing and want it bad enough."

One of the first steps is to determine what "take back your life" means to you, she said. You have to determine what you want. Is it weight loss, more education, a longer life, to be happier?

"A lot of people initially think I'm only into fitness, but I go way beyond that," said Ida. "It's not about doing one particular thing. It's changing your mindset to be able to sustain your goals."

That's what Wendy helps people to do.

"You have to be willing to move forward and trust the process. It takes time, getting out of your comfort zone, and repetition," said Ida. "You can't go halfway. You have to go all the way."

WENDY IDA'S SUPPLEMENT REGIMEN

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- DHEA
- Chromium Picolinate
- Multivitamin
- Vitamin D3
- MCT oil
- Curcumin
- MSM
- L-leucine



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Defying the Clock

When people see Ida, they are shocked to learn that she is a 67-year-old grandmother of five. What is her secret?

"Age is always age," Ida said. "But a number of things can make you more youthful."

In addition to fitness and a positive mindset, Ida believes supplements are necessary, especially for seniors.

"As you get older, everything starts declining," said Ida. "You need to put back in your body what declines with age. Doing this can keep you healthy, energetic, and lucid."

Ida herself takes numerous supplements, including DHEA, vitamin D3, curcumin, chromium picolinate, MSM, and L-leucine to name a few. She encourages people to work with their doctors and to have their various levels checked so that they can fine-tune a regimen designed specifically for their needs.

Spreading the Light

Ida has appeared on "The Dr. Oz Show," CNN, "Fox Sports Net," "Inside Edition," "Access Live," NBC, ABC, and more. As a social media influencer, she has about 94,000 followers on Facebook, Twitter, Instagram, and YouTube, which she uses as platforms to transform the lives of others.

And she is currently collaborating with AARP on a "Fit and Fun Challenge," where she'll create inspirational videos, messages, and tips for exercising and getting healthy.

Through it all, Ida has never forgotten where she came from. Telling her own, personal story of despair to triumph makes her

more relatable to her audience and encourages people to see that they, too, can take back control of their lives.

"I can't tell you how many messages have come to me begging for help, and telling me I'm their last hope," said Ida. "They see such light in me, and they want that."

And that's exactly what fuels Ida to continue pouring her life and energy into others.

"Someone was the light for me," said Ida, "and I was born to be the light for someone else." ●

Wendy Ida is an internationally recognized, best-selling author, speaker, life reinvention strategist, fitness expert, and TV host. For more information, or to book Wendy for a workshop, seminar, or retreat, visit www.wendyida.com

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Tu Casa Mi Casa

Mexican Recipes for the Home Cook

BY ENRIQUE OLVERA

Enrique Olvera is an internationally recognized chef. Pujol, his highly acclaimed restaurant in Mexico City, Mexico, is ranked #20 on the **World's 50 Best Restaurants** list, and #3 on **Latin America's 50 Best Restaurants**.

At Pujol, Olvera serves Mexican haute cuisine featuring delicacies ranging from octopus to suckling pig.

But in his latest cookbook, *Tu Casa Mi Casa*, Olvera doesn't include complicated recipes or top-chef-worthy fare. Rather, he goes back to his culinary roots -- simple home cooking.

Tu Casa Mi Casa (translation: "Your House My House") is based on the idea that food is the center of both family and culture.

"It is impossible to separate our cooking from our family story, from the products from the region we grew up in, or the regions our ancestors hailed from," said Olvera. "It is impossible not to carry, wherever your path leads you, the flavors you grew up with."

Olvera says that memory is a powerful ally when it comes to food because "it helps us travel in time to the aromas and flavors of the cuisine of our childhood."

Those memories are the foundation of *Tu Casa Mi Casa*.

With the help of three of his partners, Olvera transports you to the kitchen of his youth with a collection of 100 Mexican dishes that include staples like tamales, guacamole, carnitas, flautas, and churros.

By sharing these simple recipes designed with the home cook in mind, Olvera brings the flavors of *his* house to *yours*.

—Laurie Mathena

Lentil Salad *Ensalada de lentejas*

Preparation time: 20 minutes • Cooking time: 30 minutes • Serves: 2-4

This is a great, filling, fresh dish that was inspired by ceviche. Instead of fish, it has lentils. It is important to very slightly undercook the lentils so they do not get mushy. Top the tostadas with lentil salad in the kitchen and serve right away, or serve the salad with the tostadas on the side and assemble at the table as you go.

¾ cup (145 g) dried lentils, rinsed and picked over

½ small white onion

3 small garlic cloves, peeled

Salt

2 pasilla mixe chiles, seeded (substitute with dry chipotle chiles)

1 cup (145 g) salted roasted peanuts

⅔ cup (150 ml/5 fl oz) extra virgin olive oil

½ cup finely chopped red onion

5 small tomatillos, husked, rinsed, and chopped into small cubes

½ cup (20 g) finely chopped fresh cilantro (coriander) stems (reserve the leaves for serving)

Key lime juice

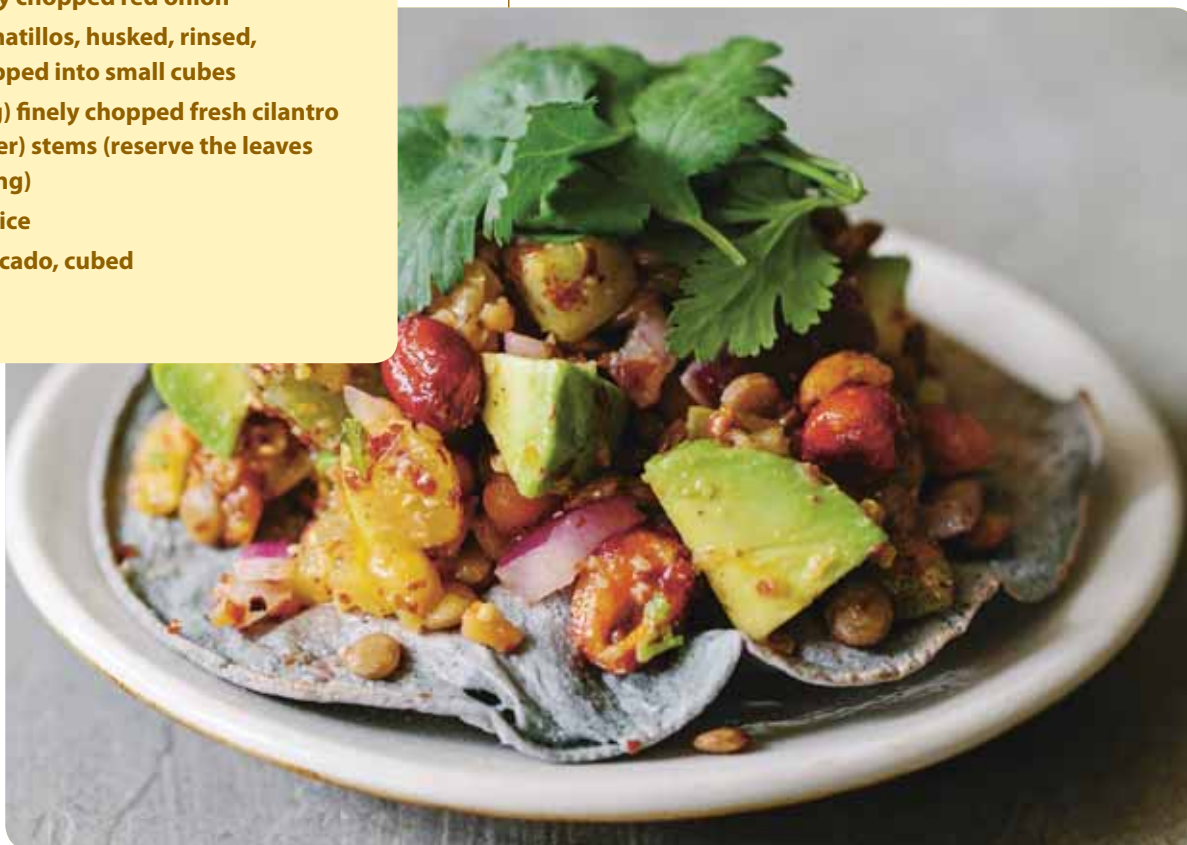
1 small avocado, cubed

Tostadas

In a pot, combine the lentils, white onion, garlic, and 1 teaspoon salt. Add enough water to cover the lentils by at least 2 inches. Cook over medium heat until the lentils are tender but not mushy, about 25 minutes. Remove the onion and garlic and discard. Adjust the salt to taste. Drain the lentils and set aside to cool to room temperature.

On a comal or frying pan over high heat, toast the pasilla mixe chiles on all sides until fragrant, 1-2 minutes, careful not to burn them. In a food processor, pulse half of the peanuts with the oil and the pasilla chiles until a thick paste is formed. Set aside.

In a bowl, combine the red onion, tomatillos, cilantro (coriander) stems, cooked lentils (at room temperature), and the remaining whole peanuts. Mix well with a wooden spoon. Slowly add the peanut/pasilla dressing. Season with Key lime juice and salt to taste. Add the avocado cubes and gently stir them in, top with cilantro leaves, and serve with small tostadas on the side.



Baked Fish with Greens *Empapelado de pescado con hierbas y quelites*

Preparation time: 15 minutes • Cooking time: 30 minutes • Serves: 4

Beyond its use for tamales, banana leaf is a very versatile and commonly used wrapper. It is wonderful for holding in moisture, it imparts a unique earthy vegetal flavor, and it is beautiful to serve the dish in. On both coasts of Mexico, banana leaf is often used to steam or bake fish. For this recipe, instead of making a sauce or marinade, we decided to let the fish speak for itself, adding only some herbs and wild greens and some citrus for aroma. The quality of the fish matters a lot when steaming—we like to use a thicker cut of a not-so-oily meaty fish like sea bass. For the herbs, you can substitute whatever is growing in your herb garden or is available at the farmers' market.

**4 large squares (about 10 inches/25 cm)
of banana leaf**

1 skinless sea bass fillet (1½ lb/680 g)

Salt

1 Key lime, sliced

1 lemon, sliced

3-4 sprigs fresh epazote

3-4 sprigs fresh cilantro (coriander)

3-4 sprigs fresh mint

**3-4 sprigs fresh lamb's quarter,
preferably small, tender leaves**

4 tablespoons extra virgin olive oil

Preheat the oven to 350°F (180°C/Gas Mark 4).

Hold the banana leaves 4 inches above an open flame until they begin to change color, about 1 minute. They should be a brighter green. If using an electric stove, heat up a large dry frying pan or griddle and press the leaves on the hot surface in quick intervals until they change color, just be careful not to brown them or dry them out.

Portion the bass into 4 pieces and season generously on all sides with salt. Portion half of the citrus and herbs onto the center of each banana leaf. Top with the fish, then top with remaining citrus and herbs. Drizzle with the olive oil. Wrap like a tamal and place on a baking sheet. Bake until the fish feels tender to touch, about 25 minutes. Serve immediately in its wrapper, letting each person unwrap their own.



Chicken Tinga *Tinga de pollo*

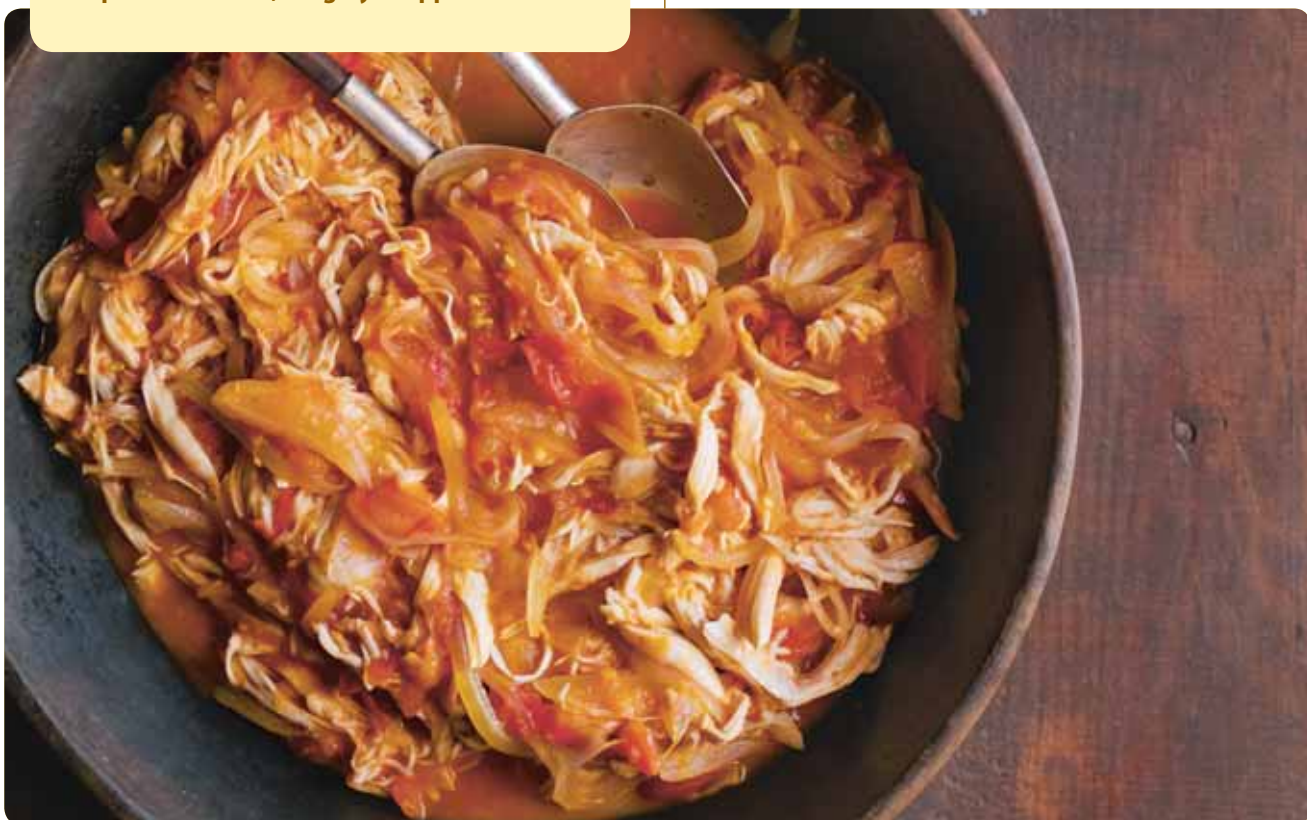
Preparation time: 10 minutes • Cooking time: 45 minutes • Serves: 2-4

The first recipe any Mexican will cook as soon as they move out of their parents' home and live on their own is chicken tinga. It is easy, reminds everyone of home, and the ingredients are very accessible. Although it is better made with dried chipotle chiles, canned chipotles work if in a pinch. It can be a soupy stew served over white rice and with tortillas. If you cook it down to thicken a bit more, it is a great topping on a tostada with fresh shredded lettuce, some crema, cheese, and fresh salsa.

1 lb (455 g) skinless, boneless chicken breast
2 large white onions, 1 halved and 1 sliced
6 garlic cloves, 3 whole and 3 sliced
1 tablespoon salt, plus more to taste
3 tablespoons vegetable oil
4 dried or canned chipotle chiles,
chopped to a paste
9 plum tomatoes, roughly chopped

In a medium pot, combine the chicken, onion halves, whole garlic cloves, and 1 tablespoon of the salt. Add water to cover and bring to simmer over medium-high heat. Simmer, uncovered, until the chicken is cooked through, 30-40 minutes, skimming occasionally to remove impurities. Remove the chicken from the broth and let rest until it is cool enough to handle. Using your hands, pull or shred the chicken and reserve. Strain and reserve the broth as well.

In a medium to large pot, heat the oil over medium heat. Add the sliced onion and garlic and cook until translucent, about 5 minutes. Add the reserved shredded chicken, the chipotle chiles, tomatoes, and 1 cup (240 ml/8 fl oz) of the chicken broth (reserve the rest for other preparations). Cook until the tomato breaks down and changes to a brick color, 5-10 minutes. Season to taste with salt. Add some more cooking broth if necessary; it should be a bit soupy. Serve hot or let cool and refrigerate for up to 1 week or freeze for up to 1 month in an airtight container.



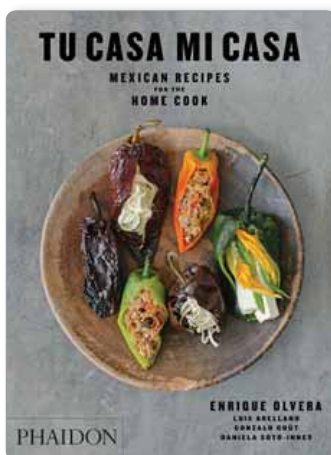
Herb Guacamole *Guacamole con hierbas*

Preparation time: 5-10 minutes • Makes: 2-3 cups

Guacamole is probably the most recognized dish from Mexico, and there are thousands of variations. We like adding fresh herbs for roundness and freshness, to contrast with the creaminess of the avocados. Beyond that, regardless of the recipe you use, there are two things that are crucial: First, use ripe avocados, they should give in to a light squeeze, but the flesh should not be bruised or blackened. Second, make sure your avocados are at room temperature. Avocados are mostly fat, and our palate can taste the nuanced flavors of fats when they are warmer. Think about it, what sounds more appetizing: warm butter on a roll or cold butter on a roll? It is one of the simplest pleasures of our cuisine. Enjoy with tostadas on the side or as a condiment in tacos or other preparations.

4 Hass avocados, at room temperature
1 serrano chile, sliced (seeded for less heat)
1 small white onion, finely diced
Juice of 1 Key lime
8 whole fresh mint leaves
8 whole fresh basil leaves
8 whole fresh tarragon leaves
15 whole fresh cilantro (coriander) leaves
1 teaspoon salt, or to taste

In a bowl, mash the avocados with a fork. Mix in all the other ingredients until completely incorporated.



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Rosemary

BY LAURIE MATHENA

Rosemary, a fragrant Mediterranean herb, is known for enhancing dishes like chicken or lamb. But as prized as it is for its culinary contributions, rosemary's **medicinal benefits** are even more impressive.

It has reached **superfood status** because of its abundance of plant compounds like **polyphenols**, **flavonoids**, and **terpenes**.

Ancient healers reportedly used rosemary for boosting the immune and circulatory system, improving memory, and promoting hair growth. Now, modern science has shown its benefits for brain health, eye health, diabetes protection, and more.

Brain Benefits

Rosemary contains **rosmarinic acid** and **carnosic acid**, shown to protect rat brain cell cultures from free radical damage.¹ This is the kind of damage that can cause strokes and neurodegeneration.

Rosemary could also be beneficial for people who have experienced a stroke. In a rat model of a stroke, a rosemary extract reduced the extent of brain injury following the stroke, reduced swelling in the brain, reduced neurologic deficit scores, and reduced the permeability of the blood-brain barrier.² This suggests that rosemary could help protect against brain damage and improve recovery following a stroke.

In another rat study, carnosic acid helped protect against **beta amyloid**-induced neurodegeneration in the **hippocampus**, the part of the brain responsible for learning and memory.³ Beta amyloid plaques are toxic protein "clumps" that accumulate in the brains of Alzheimer's patients.

Eye Protection

That same beneficial compound, carnosic acid, has been found in a preclinical study to protect the retinal cells from degeneration and toxicity.⁴ This has led researchers to conclude that it could be beneficial against **age-related macular degeneration**, the leading cause of vision loss in people over 50.

Type II Diabetes

Rosemary shows promise in helping to manage blood glucose levels. In animal models of type II diabetes, rosemary extract and two specific molecules found in rosemary (carnosic acid and rosmarinic acid) were found to have insulin-like effects that can help regulate how the body processes glucose. They also helped protect against hyperlipidemia and hyperglycemia in animal models of type II diabetics.⁵

You can enjoy rosemary in soups and sauces, in a marinade, or as a rub on meat. Or for an extra health boost, try infusing it in **extra virgin olive oil** and drizzling over a salad or on roasted vegetables.

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Grain Brain

The Surprising Truth About Wheat,
Carbs, and Sugar—
Your Brain's Silent Killers

BY DAVID PERLMUTTER, MD

Neurodegenerative diseases like Alzheimer's are expected to become a "global epidemic" by 2050, with the number of patients predicted to reach **135 million** worldwide, according to the World Health Organization.

Dr. David Perlmutter, board-certified neurologist and a Fellow of the American College of Nutrition, believes he has found the answer to this burgeoning epidemic. According to Perlmutter, the culprit isn't found in your genes; *it's on your plate*.

In his book, *Grain Brain*, Perlmutter details how wheat, carbs, and sugar are toxic substances that are poisoning our brains. When it was first released in 2013, it became a *New York Times* best seller, with more than 1.5 million copies sold, and it established Perlmutter as the leading authority on the dangers of eating wheat, carbs, and sugar.

Perlmutter has released a five-year-anniversary edition that has been completely revised and updated to reflect the latest nutritional and neurological science. This new edition includes details on how blood sugar determines brain health, how insulin resistance relates to Alzheimer's risk, and how being gluten sensitive is a key culprit behind brain diseases ranging from depression to dementia.

More importantly, Perlmutter helps you make the transition away from relying on harmful carbs—and toward a more brain-healthy lifestyle—with his detailed four-week plan of action. He includes meal plans and recipes, the best nutrients for brain health, and tips for maintaining these healthy habits for life.

"From my perspective, getting the word out that people can make simple changes to prevent a disease like Alzheimer's, for which there is no meaningful treatment, not only makes sense, but is imperative," said Perlmutter. "Now that so many physicians seem steeped in providing drug remedies, it is the right time to take a step back, review current science, and get the word out that the patients for whom we care can make choices, today, to remain healthy."

In this exclusive interview with **Life Extension®**, Perlmutter talks in more detail about how grains are destroying our brains, and how, through simple dietary changes, you have the power to prevent—and even reverse—brain conditions ranging from headaches, anxiety, and depression, to ADHD, insomnia, and even dementia.

—Laurie Mathena

LE: Many people believe that brain diseases like Alzheimer's are genetic, but you have a different explanation.

Dr. Perlmutter: There are plenty of perpetual myths about the basket of brain-degenerating maladies, which include Alzheimer's: *It's in the genes, it's inevitable with age, and it's a given if you live into your eighties and beyond.*

Not so fast.

I'm here to tell you that the fate of your brain is not in your genes. It's not unavoidable. And if you're someone who suffers from another type of brain disorder, such as chronic headaches, depression, epilepsy, or extreme moodiness, the culprit may not be encoded in your DNA.

It's largely in the food you eat.

LE: What is the number one culprit responsible for brain diseases?

Dr. Perlmutter: If the thought of your brain suffering over a bowl of savory pasta or plate of sweet French toast seems far-fetched, brace yourself. You probably already knew that processed sugars and carbs weren't all that great for you, especially in excess, but so-called healthy carbohydrates like whole grains and natural sugars? Welcome to the whole grain truth.

Modern grains are silently destroying your brain. By "modern," I'm not just referring to the refined white flours, pastas, and rice that have already been demonized by the anti-obesity folks. I'm referring to all the grains that so many of us have embraced as being healthful—whole wheat, whole grain, multigrain, seven-grain, live grain, stone-ground, and so on. Basically, I am calling what is arguably our most beloved dietary staple a terrorist group that bullies our most precious organ, the brain.

In the fall of 2012, a report in the *Journal of Alzheimer's Disease* published research from the Mayo Clinic revealing that older people who fill their plates with carbohydrates have nearly four times the risk of developing mild cognitive impairment (MCI), generally considered a precursor to Alzheimer's disease.

LE: What exactly is gluten?

Dr. Perlmutter: Gluten—which is Latin for "glue"—is a protein composite that acts as an adhesive material, holding flour together to make bread products, including crackers, baked goods, and pizza dough.

Gluten is our generation's tobacco. Gluten sensitivity is far more prevalent than we realize—potentially harming all of us to some degree without our knowing it—and gluten is hiding where you least suspect it. It's in our seasonings, condiments, and cocktails, and even in cosmetics, hand cream, and ice cream. It's disguised in soups, sweeteners, and soy products.

LE: Why is gluten so harmful to the brain?

Dr. Perlmutter: Researchers have known for some time now that the cornerstone of all degenerative conditions, including brain disorders, is inflammation. But what they hadn't documented until now are the instigators of that inflammation—the first missteps that prompt this deadly reaction. And what they are finding is that gluten, and a high-carbohydrate diet for that matter—are among the most prominent stimulators of inflammatory pathways that reach the brain.



In 2017 a consortium of scientists from high-profile institutions reported in the journal *Neurology* that high levels of inflammatory markers in the blood during midlife were associated with smaller brain volumes in late life.

But even casting aside the gluten factor, I should point out that one of the main reasons why consuming so many grains and carbs can be so harmful is that they raise blood sugar in ways that other foods, such as meat, fish, poultry, and vegetables, do not.

LE: Speaking of blood sugar, what is the connection between diabetes and dementia?

Dr. Perlmutter: First, if you're insulin resistant, not only will you starve brain cells and spur their death, but your body may not be able to break down the amyloid protein that forms those infamous plaques associated with brain disease.

Second, high blood sugar provokes menacing biological reactions that injure the body by producing certain oxygen-containing molecules that damage cells and cause inflammation that can result in hardening and narrowing of the arteries in the brain (not to mention elsewhere in the body). This condition, known as atherosclerosis, can lead to vascular dementia, which occurs when blockages and strokes kill brain tissue.

Newer research is now documenting how controlling blood sugar and reducing risk factors for type II diabetes can significantly reduce dementia risk.

LE: Is this impact of high blood sugar only a problem for diabetics?

Dr. Perlmutter: What I find really interesting is that newer



studies are showing that people with high blood sugar—whether or not they have diabetes—have a higher rate of cognitive decline than those with normal blood sugar. This was true in one particularly disturbing longitudinal study from 2018 following more than 5,000 people over 10 years. Their rate of cognitive decline—regardless of whether or not they were diabetic—hinged on blood sugar levels. The higher the blood sugar, the faster the decline—even in the non-diabetics.

LE: Gluten is known to be problematic for people with celiac disease, but what about those without celiac?

Dr. Perlmutter: Gluten isn't just an issue for those with bona fide celiac disease. As many as **40%** of us can't properly process gluten, and the remaining **60%** could be in harm's way. The question we all need to be asking ourselves is this:

What if we're all sensitive to gluten from the perspective of the brain?

Gluten sensitivity in particular is caused by elevated levels of antibodies against the gliadin component of gluten. When the antibody combines with this protein (creating an anti-gliadin antibody), specific genes are turned on in a special type of immune cell in the body. Once these genes are activated, inflammatory cytokine chemicals collect and can attack the brain. Cytokines are highly antagonistic to the brain, damaging tissue and leaving the brain vulnerable to dysfunction and disease especially if the assault continues.

Given this, it's no wonder that elevated cytokines are seen in Alzheimer's disease, Parkinson's disease, major depression, multiple sclerosis, and even autism.

LE: Does this mean everyone should get tested for gluten sensitivity?

Dr. Perlmutter: I no longer recommend testing for gluten sensitivity because it's best to assume that you are sensitive to gluten and avoid it entirely—even if you have no celiac and have tested negative to gluten sensitivity in the past.

LE: But you do recommend getting a fasting insulin test. Why is that?

Dr. Perlmutter: Having normal blood sugar levels may mean that the pancreas is working overtime to keep that blood sugar normal. Based upon this understanding, you can see that high insulin levels will happen long before blood sugar rises and a person becomes diabetic. That's why it's so important to check not only your fasting blood sugar, but also your fasting insulin level. An elevated fasting insulin level is an indicator that your pancreas is trying hard to normalize your blood sugar. It's also a clear signal that you are consuming too much carbohydrate.

And make no mistake about it: Even being insulin resistant is a powerful risk factor for brain degeneration and cognitive impairment.

Consider an Italian study done back in 2005 that looked at 523 people aged 70 to 90, who did not have diabetes or even elevated blood sugar. Many of them were insulin resistant, however, as determined by their fasting insulin levels. The study revealed that those individuals who were insulin resistant had a dramatically increased risk of cognitive impairment compared to those within the normal range.

LE: What other neurological problems can gluten impact?

Dr. Perlmutter: The facts of “grain brain” go far beyond just hampering neurogenesis and increasing your risk for cognitive challenges that will progress stealthily over time. A diet heavy

in inflammatory carbs and low in healthy fats messes with the mind in more ways than one—affecting risk not just for dementia but for common neurological ailments such as ADHD, anxiety disorder, Tourette's syndrome, mental illness, migraines, and even autism.

LE: You discuss shifting away from carbs and toward healthy fats like those found in fish, olive oil, avocado, and nuts. Why is fat so critical for brain health?

Dr. Perlmutter: Fat is and always has been a fundamental pillar of our nutrition. Beyond the fact that the human brain consists of more than **70%** fat, fat plays a pivotal role in regulating the immune system. Simply stated, good fats like omega-3s and monounsaturated fats reduce inflammation, while modified hydrogenated fats, so common in commercially prepared foods, dramatically increase inflammation.

Certain vitamins, notably A, D, E, and K, require fat to get absorbed properly in the body, which is why dietary fat is necessary to transport these “fat-soluble” vitamins. Because these vitamins do not dissolve in water, they can be absorbed from your small intestine only in combination with fat. Deficiencies due to incomplete absorption of these vitally important vitamins are always serious, and any such deficiency can be linked to brain illness, among many other conditions.

LE: Are there nutrients you can take that will help protect the brain from the harmful effects of grains and other carbs?

Dr. Perlmutter: Perhaps no other brain-boosting molecule is receiving as much attention lately as is docosahexaenoic acid (DHA).





For the past several decades, scientists have been aggressively studying this critical brain fat for at least three reasons.

First, more than two-thirds of the dry weight of the human brain is fat, and of that fat, one-quarter is DHA. Structurally, DHA is an important building block for the membranes surrounding brain cells, particularly the synapses, which lie at the heart of efficient brain function.

Second, DHA is an important regulator of inflammation. It naturally reduces the activity of the COX-2 enzyme, which turns on the production of damaging inflammatory chemicals. DHA also acts like a warrior in many ways when it enters hostile territory brought on by poor diet.

It can fight back inflammation when a war ensues within the intestinal lining of a gut that is gluten sensitive. And it can block the damaging effects of a diet high in sugar, especially fructose, and help prevent metabolic dysfunctions in the brain that can result from too many carbs in the diet.

The third, and arguably most exciting, activity of DHA is its role in regulating gene expression for production of BDNF (which plays a key role in creating new neurons). Put simply, DHA helps orchestrate the production, connectivity, and viability of brain cells, while at the same time enhancing function.

LE: In your book, you take readers through a four-week plan of action to remove grains and other carbohydrates from their diet. Besides helping prevent dementia, what other results can be expected from following your grain-free program?

Dr. Perlmutter: Some of my most remarkable case studies involve people transforming their lives and health through the total elimination of gluten from their diets and a new appreciation for fats instead of carbs. I've watched this single dietary shift lift depression, relieve chronic fatigue, reverse type II diabetes, extinguish obsessive-compulsive behavior, and cure many neurological challenges, from brain fog to bipolar disorder.

LE: The information about diet and brain disorders is actually very encouraging.

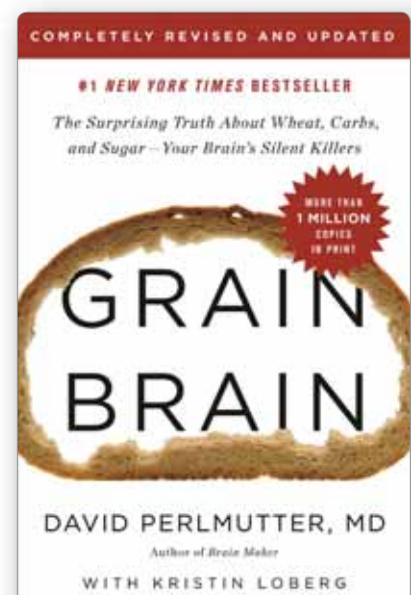
Dr. Perlmutter: The idea that we can treat—and in some cases, totally eliminate—common neurological ailments through diet alone is empowering. Most people immediately turn to drugs when seeking a solution, oblivious to the cure that awaits them in a few lifestyle shifts that are highly practical and absolutely free. ●

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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38 ENHANCE MALE SEXUAL HEALTH

A **ginger-like root** improved sexual health in **61.5%** of male participants in as few as 30 days.



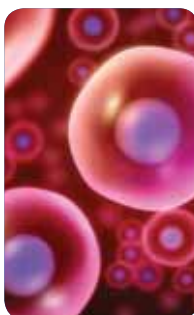
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