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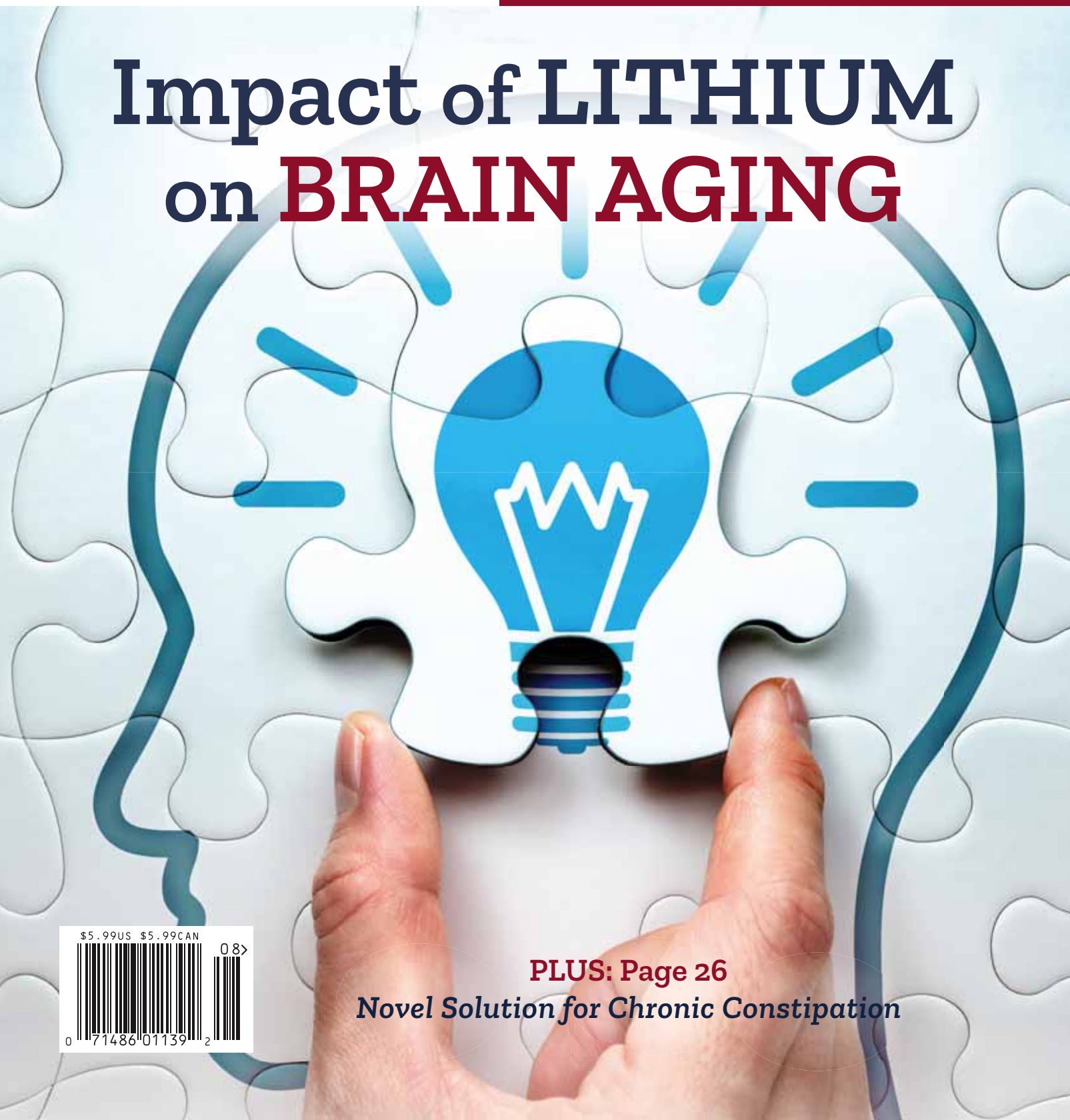

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LIFE EXTENSION®

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LifeExtension.com August 2021

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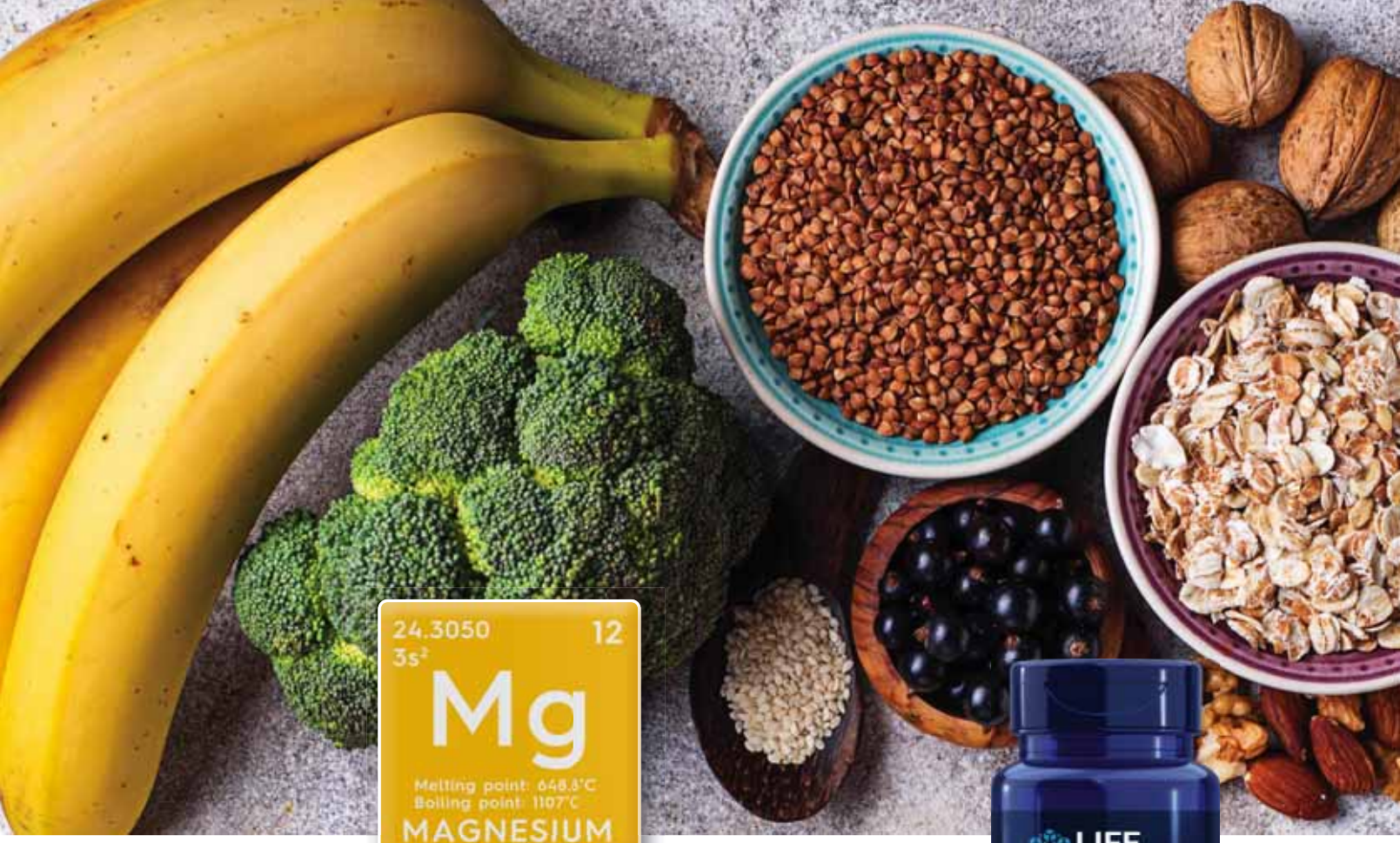

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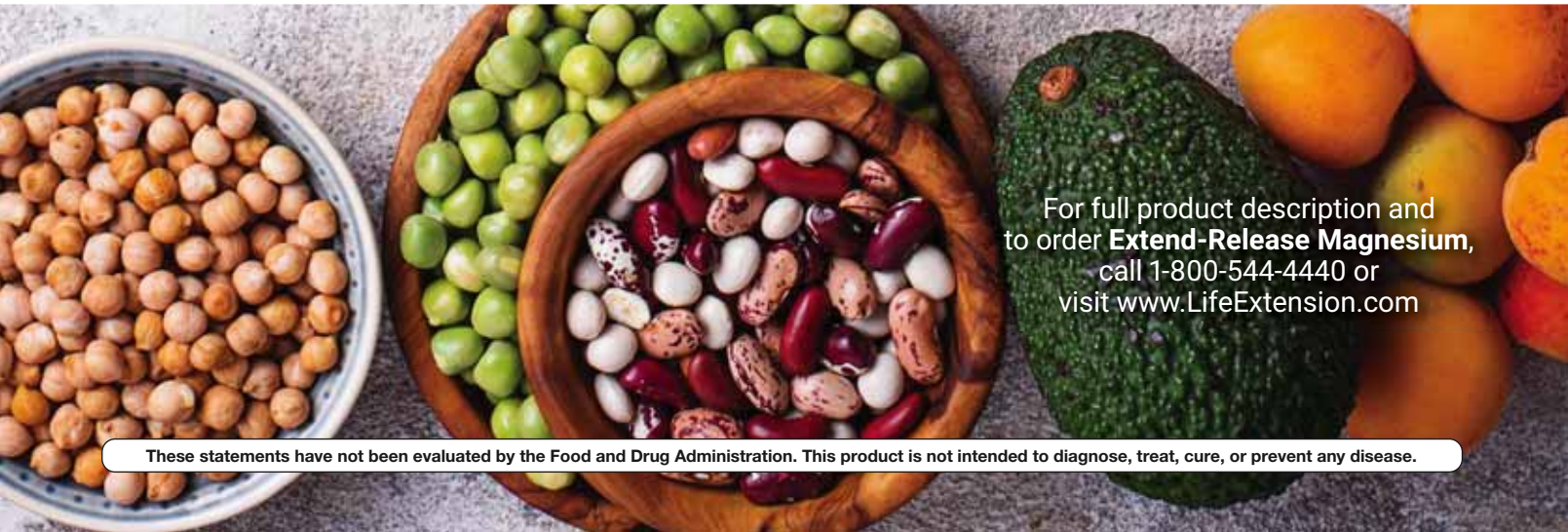

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MEDICAL ADVISORY BOARD

Sandra C. Kaufmann, MD, is a fellowship-trained and board-certified pediatric anesthesiologist as well as the Chief of Anesthesia at the Joe DiMaggio Children's Hospital in Hollywood, Florida. She is the founder of The Kaufmann Anti-Aging Institute and the author of the book The Kaufmann Protocol: Why we Age and How to Stop it (2018). Her expertise is in the practical application of anti-aging research.

Richard Black, DO, is a dedicated nuclear medicine physician practicing as an independent contractor out of Cleveland, Ohio. Dr. Black is board certified in internal medicine and nuclear medicine, and is licensed to practice medicine in multiple states throughout the United States.

John Boik, PhD, is the author of two books on cancer therapy, Cancer and Natural Medicine (1996) and Natural Compounds in Cancer Therapy (2001). He earned his doctorate at the University of Texas Graduate School of Biomedical Sciences with research at the MD Anderson Cancer Center, focusing on screening models to identify promising new anti-cancer drugs. He conducted his postdoctoral training at Stanford University's Department of Statistics.

Aubrey de Grey, PhD, is a biomedical gerontologist and Editor-in-Chief of Rejuvenation Research, the world's highest-impact, peer-reviewed journal focused on intervention in aging. He received his BA and PhD from the University of Cambridge in 1985 and 2000 respectively. Dr. de Grey is a Fellow of both the Gerontological Society of America and the American Aging Association and sits on the editorial and scientific advisory boards of numerous journals and organizations.

Deborah F. Harding, MD, is founder of the Harding Anti-Aging Center. She is double board-certified in internal medicine and sleep disorder medicine. She also earned the Cenegenics certification in age management medicine. She is a faculty member of the University of Central Florida Medical School.

Steven B. Harris, MD, is president and director of research at Critical Care Research, a company that grew out of 21st Century Medicine in Rancho Cucamonga, CA. Dr. Harris participates in groundbreaking hypothermia, cryothermia, and ischemia research. His research interests include antioxidant and dietary-restriction effects in animals and humans.

Peter H. Langsjoen, MD, FACC, is a cardiologist specializing in congestive heart failure, primary and statin-induced diastolic dysfunction, and other heart diseases. A leading authority on coenzyme Q10, Dr. Langsjoen has been involved with its clinical application since 1983. He is a founding member of the executive committee of the International Coenzyme Q10 Association, a fellow of the American College of Cardiology, and a member of numerous other medical associations.

Dipnarine Maharaj MD, MB, ChB, FRCP (Glasgow), FRCP (Edinburgh), FRCPath., FACP, is the Medical Director of the South Florida Bone Marrow Stem Cell Transplant Institute and is regarded as one of the world's foremost experts on adult stem cells. He received his medical degree in 1978 from the University of Glasgow Medical School, Scotland. He completed his internship and residency in Internal Medicine and Hematology at the University's Royal Infirmary.

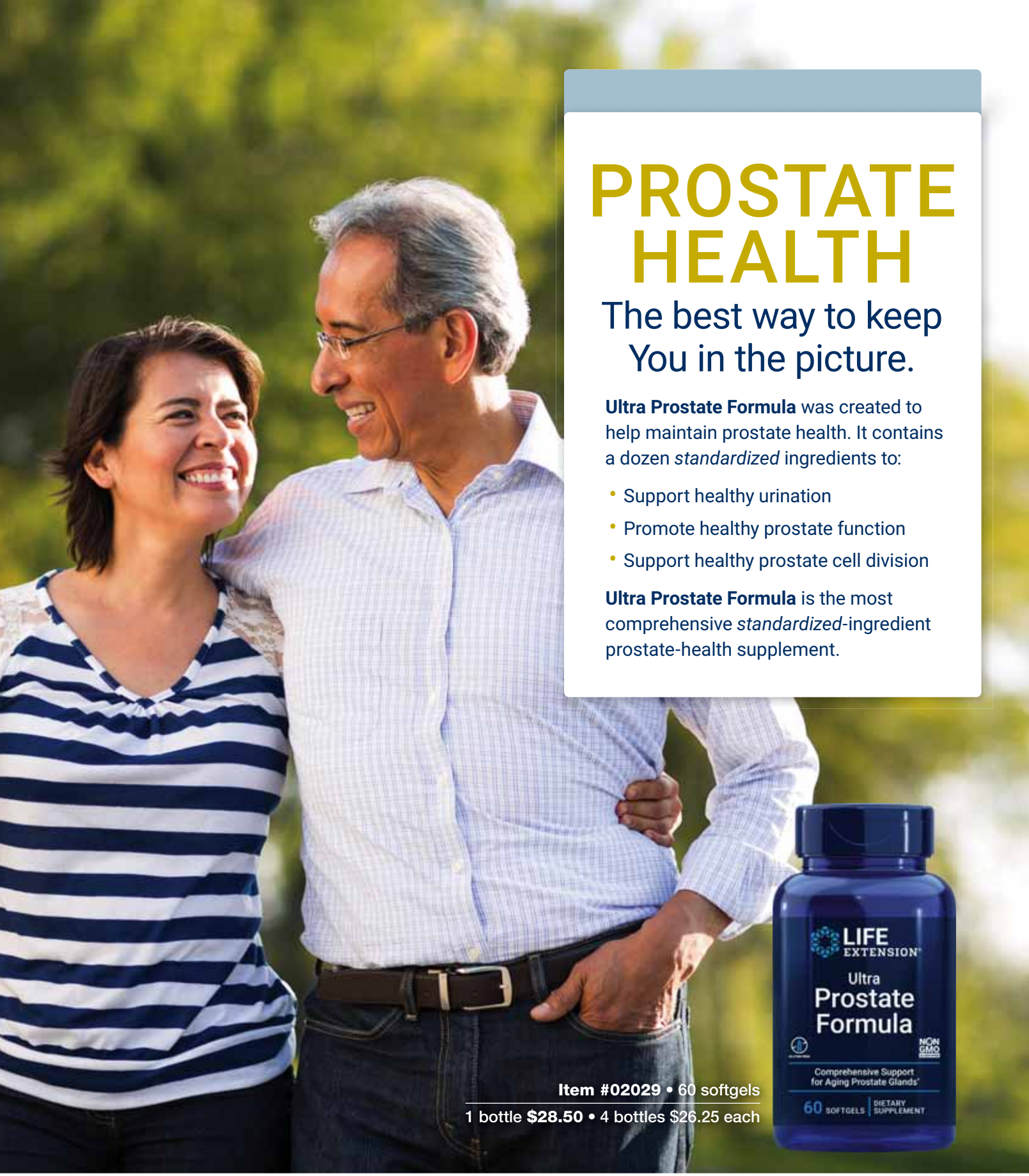
L. Ray Matthews, MD, FACS, is a professor of surgery and director of Surgical Critical Care at Morehouse School of Medicine in Atlanta, GA, and a trauma and critical care surgeon at Grady Memorial Hospital. He has published widely and is known as one of the top vitamin D experts. Dr. Matthews has spoken before the U.S. Food and Drug Administration several times, presenting a recent update about clinical research on vitamin D.

Ralph W. Moss, PhD, is the author of books such as Antioxidants Against Cancer, Cancer Therapy, Questioning Chemotherapy, and The Cancer Industry, as well as the award-winning PBS documentary The Cancer War. Dr. Moss has independently evaluated the claims of various cancer treatments and currently directs The Moss Reports, an updated library of detailed reports on more than 200 varieties of cancer diagnoses.

Michael D. Ozner, MD, FACC, FAHA, is a board-certified cardiologist who specializes in cardiovascular disease prevention. He serves as medical director for the Cardiovascular Prevention Institute of South Florida and is a noted national speaker on heart disease prevention. Dr. Ozner is also author of The Great American Heart Hoax,The Complete Mediterranean Diet and Heart Attack Proof. For more information visit www.drozner.com.

Jonathan V. Wright, MD, is medical director of the Tahoma Clinic in Tukwila, WA. He received his MD from the University of Michigan and has taught natural biochemical medical treatments since 1983. Dr. Wright pioneered the use of bioidentical estrogens and DHEA in daily medical practice. He has authored or co-authored 14 books, selling more than 1.5 million copies.

Xiaoxi Wei, PhD, is a chemist, expert in supramolecular assembly and development of synthetic transmembrane nanopores with distinguished selectivity via biomimetic nanoscience. She has expertise in ion channel function and characterization. She founded X-Therma Inc., a company developing a radical new highway towards non-toxic, hyper-effective antifreeze agents to fight unwanted ice formation in regenerative medicine and reduce mechanical icing.



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What's Behind the Rise in Pancreatic Cancer Cases?

WILLIAM FALOON

You may have noticed that a lot of famous people are succumbing to **pancreatic cancer**.

It is not a coincidence.

Pancreatic cancer incidence has steadily increased in the United States by about **1.2%** annually over the last 10 years.[1]

The lethality of a pancreatic malignancy has generated volumes of scientific data on how to reduce your risk of contracting it.

The good news for readers of ***Life Extension***® magazine is they already follow many of these healthy diets and lifestyles.

What troubles me, however, is that a leading pancreatic cancer **risk factor** (tobacco use) has plummeted since the **1960s-1970s**.

Yet, **pancreatic cancer** cases are not declining.

This editorial describes what's behind rising numbers of Americans who perish from **pancreatic cancer** and what can be done to reverse this deadly trend.

1. **John Lewis.** Congressman, civil rights legend. 2020.
2. **Alex Trebek.** Host of the game show *Jeopardy!* 2020.
3. **Ruth Bader Ginsburg.** Supreme Court justice. 2020.
4. **Aretha Franklin.** Queen of Soul. 2018.
5. **Luciano Pavarotti.** Opera star. 2007.
6. **Dizzy Gillespie.** Jazz trumpet great. 1993.
7. **Sally Ride.** Astronaut. 2012.
8. **Patrick Swayze.** Actor. 2009.
9. **Michael Landon.** TV star. 1991.
10. **Gene Upshaw.** Football great. 2008.
11. **Karl Lagerfeld**. Designer. 2019.
12. **Bob Gibson.** Hall-of-Fame baseball great. 2020.

Prominent Figures Who Have Succumbed to Pancreatic Cancer

In **1967**, when I was 12 years old, my best friend's mother perished from **pancreatic cancer**. Her relatively young age and six young children made this a particularly tragic event.

At her funeral no one would have conceived that **54 years later** there would be no **cure**.

Instead of curative therapy, most metastatic pancreatic cancer victims are offered palliative choices that provide only a limited amount of survival time depending upon treatment regimen. The survival variance often depends on what degree of chemotherapy toxicity the patient is willing to tolerate.

Few pancreatic cancer patients survive more than 18 months when relying on chemo drugs that were approved decades ago.

The lack of progress in better treatment options is inexcusable when one considers the advances made in other areas of medical practice. This includes cardiac **stenting** that was unheard of in the **1960s** and is now a routine treatment for **coronary artery disease**.

Surging Global Incidences of Pancreatic Cancer

A comprehensive analysis, published in the prestigious journal ***The Lancet***, revealed a sharp increase of pancreatic cancer worldwide.[2]

From **1990** to **2017** the number of pancreatic cancer cases more than doubled from **195,000** to **448,000 cases**.

Better reporting of causes of death over these decades is partially responsible for this statistical surge, but the increase, as noted in *The Lancet,* is of international concern.

The Lancet article concluded:

"Prevention strategies should focus on modifiable risk factors. Development of screening programs for early detection and more effective treatment strategies for pancreatic cancer are needed."

Surgery for Pancreatic Cancer

By the time most pancreatic cancers are diagnosed, the malignancy has spread into the liver and adjacent tissues. Chemo at these advanced states becomes a death-delaying option.

Some patients are diagnosed *early* enough for potential curative **surgery**.

In **1935**, a doctor named **Allen Whipple** devised a more effective way to remove a section of the **pancreas** and adjacent body parts.[4,5]

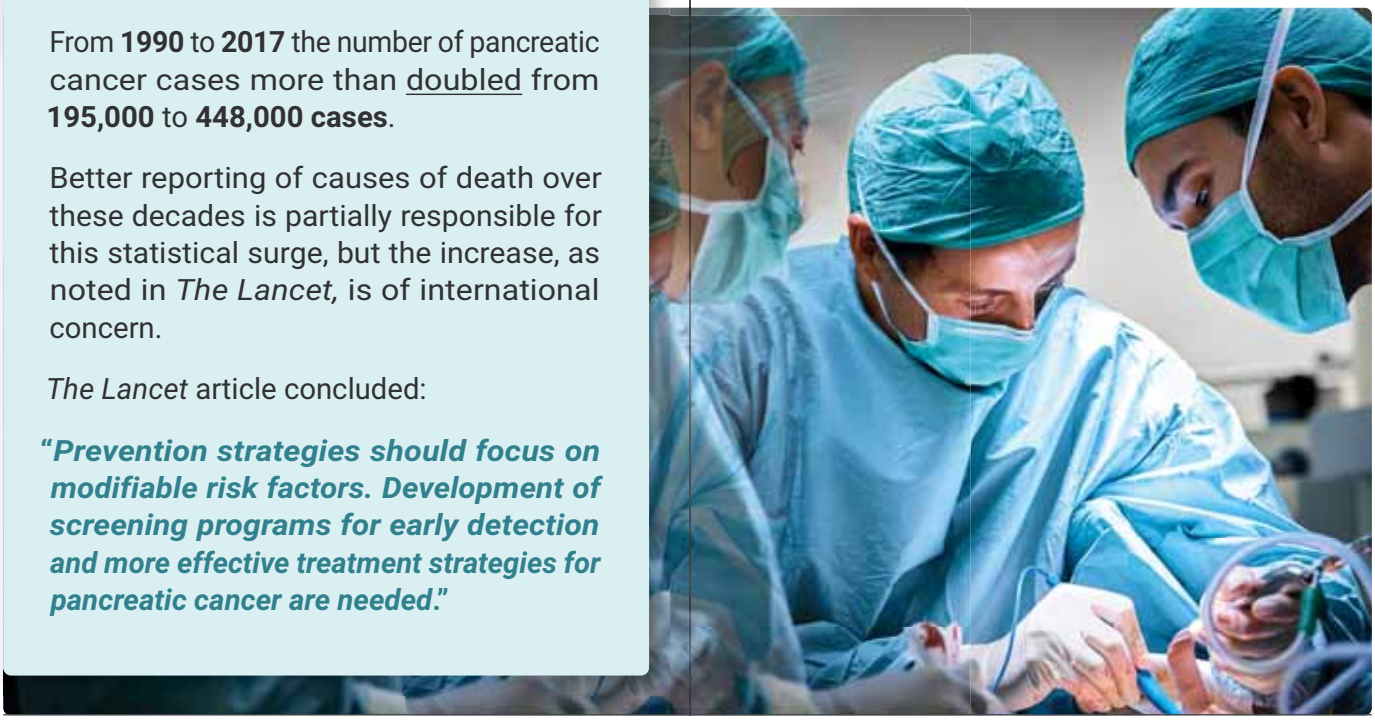
Dr. Whipple's technique removes the head of the pancreas, along with portions of the stomach, first part of the small intestine, gallbladder, and the bile duct.

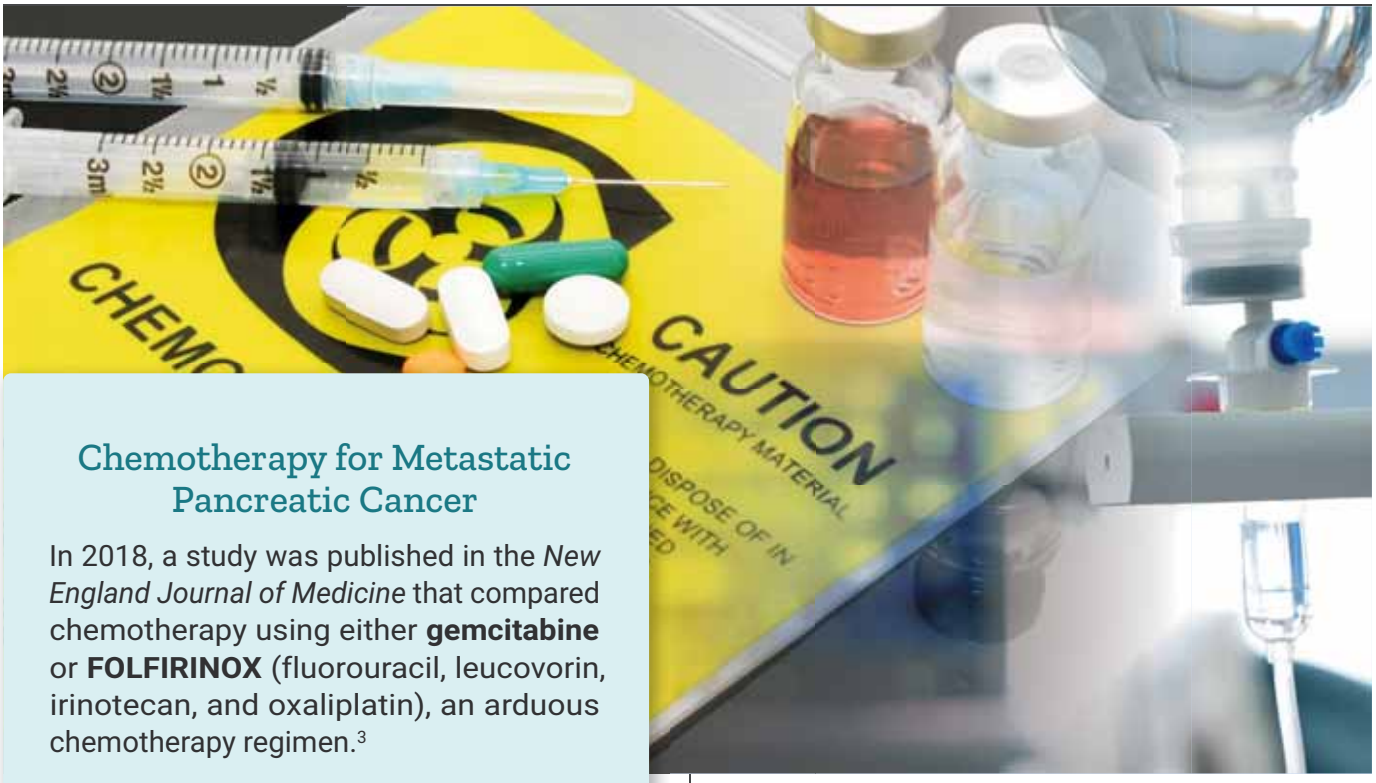
The impact of this procedure on the body, even in **2021**, is severe, with a *higher* death rate compared to many other types of surgeries.[6]

The rearranged internal organs do not always hold together, and infection can spread inside the patient. This can lead to more surgeries, and in some cases the remainder of the pancreas and the spleen must be removed to correct problems from the first operation.

Some patients do not heal well and leak pancreatic fluid from where body parts are sewn together. This happens so frequently that the surgeon leaves in drainage catheters for fluids to exit so they do not accumulate inside the patient.[7-9]

Despite these horrific side effects, most patients who survive the painful surgical ordeal (called the "Whipple Procedure") will **die** from metastatic **pancreatic cancer**.





Chemotherapy for Metastatic Pancreatic Cancer

In 2018, a study was published in the *New England Journal of Medicine* that compared chemotherapy using either **gemcitabine** or **FOLFIRINOX** (fluorouracil, leucovorin, irinotecan, and oxaliplatin), an arduous chemotherapy regimen.[3]

At a median follow-up of 33.6 months, the median disease-free survival was **21.6** months in the **FOLFIRINOX** group, with **39.7%** of patients disease-free and alive at three years. The **gemcitabine** group had median disease-free survival of only **12.8** months with **21.4%** alive and disease-free at three years.

Serious adverse events (grade 3 or 4) occurred in **75.9%** of the patients in the modified-**FOLFIRINOX** group compared to **52.9%** in the gemcitabine group.

This study showed that **chemotherapy** that inflicted harsher side effects (**FOLFIRINOX**) improved survival time.

These data are based on an unusual patient population that first underwent a brutal surgical (Whipple) procedure followed by two choices of chemo regimens **(gemcitabine** or **FOLFORINOX**). The chemo alone did not enable these higher rates of survival.

There is a clear need for more effective treatments for pancreatic cancer.

Risk Factors You Control

Significant investigative resources have been deployed to identify **modifiable risk factors** that can enable people to reduce their odds of developing pancreatic cancer.

A **modifiable risk factor** is one that YOU have control over.

Few readers of ***Life Extension***® magazine use tobacco, but they should know that exposure to **secondhand smoke** can increase pancreatic cancer risk by over **50%**.[13]

About **25%** of pancreatic cancers relate to cigarettes.[14] Yet smoking rates have plummeted since the **1960s-1970s** while **pancreatic cancer** incidence has steadily increased.

One villain is the surging numbers of **overweight** and **obese** Americans. Close to half of all adults in the United States today are **pre-diabetic** or **type II diabetic**.[15]

Compared to normal-weight people, **obese** individuals have about a **50%** increased risk of developing **pancreatic cancer**, as well as lower overall survival rates.[16-18] That's about the same risk as **cigarette smokers**, which helps explain why pancreatic cancer incidence is not declining despite reductions in **tobacco** use.

Steve Jobs
(1955-2011)

Steve Jobs, Pancreatic Cancer Victim

Steve Jobs was criticized for delaying a **Whipple Procedure** for nine months after being diagnosed with **pancreatic cancer**.[10]

The initial approaches Steve Jobs tried (acupuncture, vegan diet, herbs, spiritualists) had no chance of eradicating his pancreatic tumor.

It's hard to blame the then **49**-year-old co-founder of **Apple** for not wanting his body cut up via a **Whipple Procedure**.

Steve Jobs eventually died at age **56** after undergoing multiple aggressive treatments, including a liver transplant.[11,12]

If one is diagnosed with pancreatic cancer at an early stage today, a procedure made clinically relevant back in **1935** (the **Whipple Procedure**) is still the best treatment option.

Better treatments are urgently needed.

Dr. Allen Whipple
(1881-1963)

Both excess body weight and smoking are pancreatic cancer risk factors.[19] Those who would never touch a **cigarette** may not realize the similar dangers inflicted from excess **body fat**.

Heavier individuals, especially when **fat** accumulates in the belly, are often in a **chronic inflammatory** state and have **glucose control** issues.[20]

Type II diabetes and **chronic inflammation** increase the risk of multiple degenerative disorders, including pancreatic cancer.[21,22]

To put the danger of **inflammation** in context, those with **chronic pancreatitis** have up to an **eight-fold** *higher* risk of developing **pancreatic cancer**.[23]

There is a lot to be gained from normalizing one's body weight. The benefits include reduced **inflammation**, improved glycemic control, and lower risk for many cancers.

Chronic pancreatitis is long-term inflammation of the pancreas that typically causes severe pain in the center of your belly and/or extending through to your back. The cell damage inflicted by **pancreatitis** increases future **pancreatic cancer** incidence. Risk factors for pancreatitis include obesity and excess alcohol ingestion.[24]

Dietary Factors

What you eat and drink impacts your pancreatic cancer risk up to **30%-50%**. Certain foods are associated with *higher* **risk**, while others confer **protection**.[25-27]

Consumption of red meats (especially when cooked at high temperature), fried foods, and foods containing nitrosamines (processed meats) may increase pancreatic cancer risk.[28,29]

One meta-analysis that included 11 case-control studies found that **red meat** intake increased **pancreatic cancer** risk by about **48%**.[30]

Yet other studies of meat consumption and various cancer risks are inconsistent and less conclusive.[31]

On the **protective** side, high intake of **vegetables** and **fruits** decreased pancreatic cancer risk by **38%** and **29%**, respectively.[30]

Increased **nut** consumption was shown to significantly lower risk of pancreatic cancer.[32,33]

In a large UK study published in **2016**, mortality for pancreatic cancer was lower for less-frequent **meat eaters** (about **45%** lower mortality), as well as **vegetarians** and **vegans** (about **50%** lower mortality) compared with regular **meat eaters**.[34]

For those who insist on eating some **red meat**, it's good to know that reducing **total red meat intake** may confer risk reduction.

The article on page 50 of this month's issue describes dietary factors most associated with pancreatic cancer risk reduction, including **lycopene** from tomatoes and **carotenoids** from other foods.

Role of Magnesium

In the **December 2016** issue of ***Life Extension***® magazine I wrote an article[35] based on a landmark study showing a modest increase in **magnesium** intake from diet and supplements resulted in profound reductions in **pancreatic cancer** risk.[36]

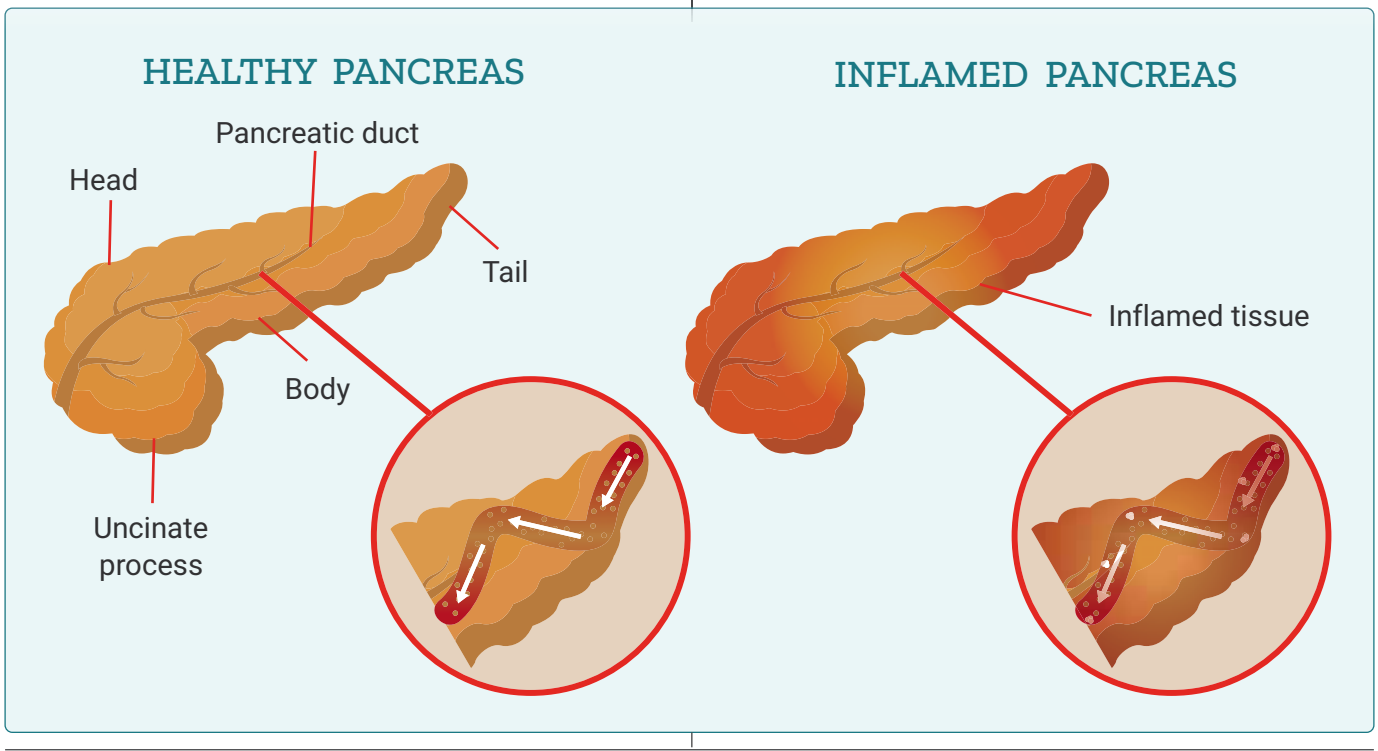
What struck me about this study's findings is that it did not require a ***large*** amount of additional magnesium to produce a meaningful reduction in pancreatic cancer risk.[36]

For example, compared to a person who ingests **300 mg** a day of magnesium, an individual with a daily **magnesium** intake of **200 mg** would be expected to have a **24%** increased risk of **pancreatic cancer**.

Both intakes (**200 mg** and **300 mg** a day of magnesium) are considered **deficient** even by government standards.

This 2015 published study involved over 66,000 men and women aged 50-76 years who were followed for an eight-year period. The subjects were divided into the following three groups based upon their **magnesium** intake:

- **Optimal Intake** - Defined as ingesting greater than or equal to **100%** of the government recommended dietary allowance (RDA) for magnesium (**420 mg** a day for males and **320 mg** a day for females)
- **Sub-optimal Intake** - Daily intake of only **75%** to **99%** of the government RDA for magnesium
- **Deficient Intake** - Less than **75%** of the government RDA for magnesium (less than **315 mg** a day for males and less than **240 mg** a day for females)



Those who ingested **75%-99%** of the government's RDA for **magnesium** (sub-optimal intake) had a **42%** *greater* risk of **pancreatic cancer** incidence compared with those ingesting greater than or equal to **100%** of the **magnesium** RDA.

Those who ingested less than **75%** of the government's RDA for magnesium (deficient intake) had a striking **76%** *greater* risk of **pancreatic cancer** incidence compared to those whose intake of magnesium was equal to or greater than the government's (optimal intake) RDA.

When analyzing those who met or exceeded the government's RDA for total magnesium intake, only those who took **dietary supplements** containing **magnesium** were able to consistently achieve the benefits.

What struck me about these findings is that the amount of added **magnesium** needed to meet the government's RDA was exceedingly small.

For most people, taking one low-cost **magnesium capsule** a day, or obtaining it in a sufficient potency multi-nutrient formula, is all that may be needed to garner protective effects.

Intolerable Delays

The snail's pace of progress against malignancies like pancreatic cancer should provoke societal outrage.

Like lambs standing in line awaiting slaughter, the public tolerates mediocre medicine that inflicts horrific suffering and needless deaths.

By contrast, we here at **Life Extension®** view bureaucratic roadblocks that impede delivery of better cancer treatments as ***intolerable delays*** that will be ridiculed by future historians.

I am not implying that there are an insufficient number of ongoing clinical trials. As of this writing there were about 500 human trials recruiting pancreatic cancer patients.

The urgency is for the **57,000** Americans who will be diagnosed with pancreatic cancer over the next 12 months. Where are the **improved treatments** for them?

Life Extension® has updated its **Pancreatic Cancer Protocol** (LifeExtension.com/pancreatic) to describe the use of repurposed **drugs** that may improve patient outcomes. Many of these treatments are not being incorporated into conventional practice.

Take Control!

About **10%** to **20%** of **pancreatic tumors** (adenocarcinomas) are thought to be due to a heritable cause that includes mutations in the ***BRCA1***, ***BRCA2*** and other cell regulatory genes.[37,38]

This implies that most (around **80%**) of pancreatic cancers may be attributed to **modifiable** behavior patterns.

Hard data show the risk of developing **pancreatic cancer** can be reduced if people follow healthier diet and lifestyle practices.

Healthy choices not only help protect against most malignancies, but also reduce incidences of cardiovascular disorders and dementia.

Most Americans engage in behaviors that spike disease risk. The tragic impact can be seen with increasing rates of common malignancies.

Beyond unhealthy lifestyle choices is a **pharmaceutical industry** that is failing to deliver meaningful improvements in treating pancreatic cancer and other deadly malignancies.

Mutated ***BRCA*** genes are associated with a high risk of breast, ovarian, and other cancers.[39] Women who test BRCA positive sometimes undergo prophylactic removal of both breasts and their ovaries at young ages.

I cannot fathom why these barbaric procedures are tolerated in a world where rapid technological advances are taken for granted.

Young bodies are mutilated, toxic treatments deployed that do not cure, and oncology drugs prescribed that cost over $100,000. Yet pancreatic cancer deaths spiral upward each year.

Cancer Establishment's Position

A report published earlier this year showed **cancer death rates** went down **31%** from 1991-2018 in response to reductions in smoking and to *earlier* diagnoses and some improved treatments.[40] But this does not spare the more than **600,000** Americans who will perish from a malignancy over the next 12 months.

Greater priority given to discovering **curative** treatments is urgently needed. This will not happen until the public demands meaningful changes.

In the meantime, I urge readers to **take control** of their individual risk factors to reduce odds of contracting deadly digestive tract malignancies including colon, esophageal, and pancreatic cancers.

For longer life,

William Faloon, Co-Founder
Life Extension® Buyers Club

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

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Reference: * *Gerontology.* 1996;42(3):170-80.

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Vitamin K2 (MK-4) (for bone & vascular health)	**1,000 mcg**
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Vitamin K2 (MK-7) (long-acting protection)	**181 mcg**
Vitamin K2 (MK-9) (added cardiovascular support)	**43 mcg**
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Japanese physicians use ***high-dose*** **vitamin K2** for those with challenges in maintaining healthy bone density. **Mega Vitamin K2** costs **95 cents** a day and provides in one daily capsule:

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In the News

Probiotic Use Associated with Fewer Upper Respiratory Tract Symptoms

Findings from a study presented at Digestive Disease Week® 2021 revealed an association between the use of **probiotics** and a reduction in upper respiratory tract symptoms among older and overweight men and women.*

The research team reviewed diary entries completed by the subjects during the trial to determine the presence of upper respiratory symptoms that included sore throat, wheezing, and coughing.

After one to two weeks of supplementation, subjects who received probiotics exhibited a delay in the time it took to record their first upper respiratory tract symptoms.

At the end of the study, there was a **27%** lower incidence of upper respiratory tract symptoms reported by probiotic-supplemented participants in comparison with those who received a **placebo**.

Editor's Note: The benefit of probiotics supplementation was greatest among those people who were at least 45 years of age, or who were obese.

* *Digestive Disease Week®* 2021. May 23.

Magnesium, B Vitamins, Green Tea, Rhodiola, Manage Stress

An article in *Nutritional Neuroscience* reported an improved response to the effects of social stress following supplementation with **magnesium**, **B vitamins**, **green tea**, and **rhodiola** in a trial involving moderately stressed men and women.*

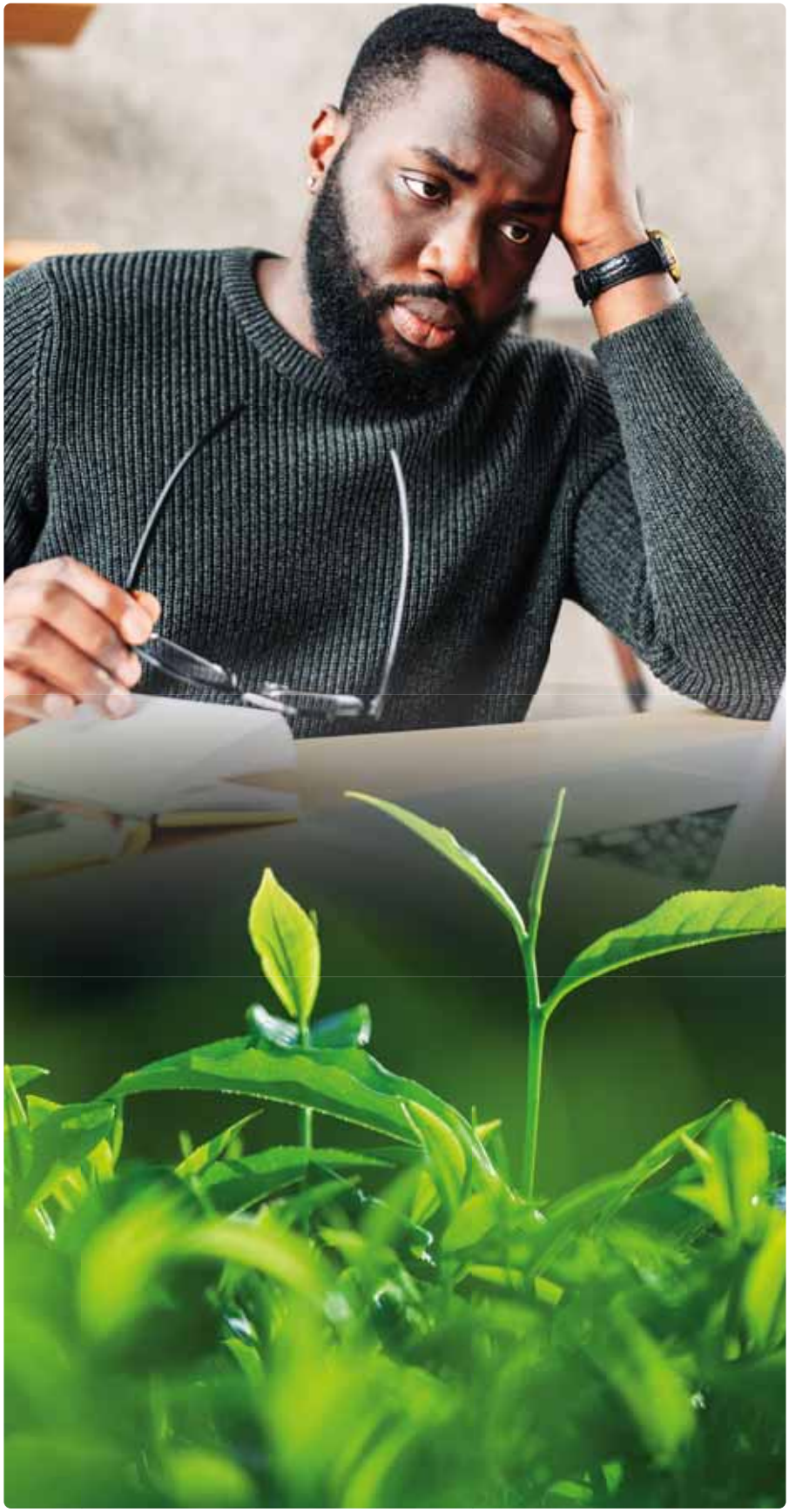
Participants received a placebo or one of three nutrient combinations. The first treatment group received magnesium, vitamin B6, vitamin B12, folate, green tea extract, and rhodiola extract. The second group was given magnesium, B vitamin complex, and rhodiola extract, and the third group received magnesium, B vitamin complex, and green tea extract.

After receiving the supplements, the participants underwent a social-stress-inducing test, and resting state EEG was administered.

Combined treatment with magnesium, B vitamin complex, green tea, and rhodiola was associated with a significant increase in theta waves as measured by EEG, indicating a relaxed, alert state. Participants in this group reported less subjective stress, anxiety, and disturbed mood.

Editor's Note: "There is a significant practical **benefit of a nonpharmaceutical** method of reducing the negative impact of stress, considering the associated profound detriment to the quality of life of individuals and substantial social and economic societal costs," the authors stated.

* *Nutr Neurosci.* 2021 Apr 26;1-15.



Women Needing Knee Replacement Shown to have Vitamin D Deficiency

Having enough vitamin D may not only help prevent some pain associated with total knee (replacement) surgery but could help to prevent the condition in the first place, according to a study published in *Menopause*.*

The research included 226 post-menopausal women scheduled for total knee replacement who had 25-hydroxyvitamin D levels of less than **30 ng/mL** or moderate levels of *at least* **30 ng/mL**.

Of the women needing knee replacement, **67%** had less than **30 ng/mL** of ***25-hydroxyvitamin D***.

Editor's Note: In addition to deficient levels of vitamin D, smoking and having a high body mass index (BMI) were independent risk factors for experiencing moderate to severe pain following knee replacement surgery.

* *Menopause.* 2021 May 5.

Higher Dietary Antioxidant Intake Associated with Lower Cognitive Impairment

Among older individuals who consumed more antioxidants, there was a lower risk of cognitive impairment later in life, a study in *The Journals of Gerontology® Series A* reported. *

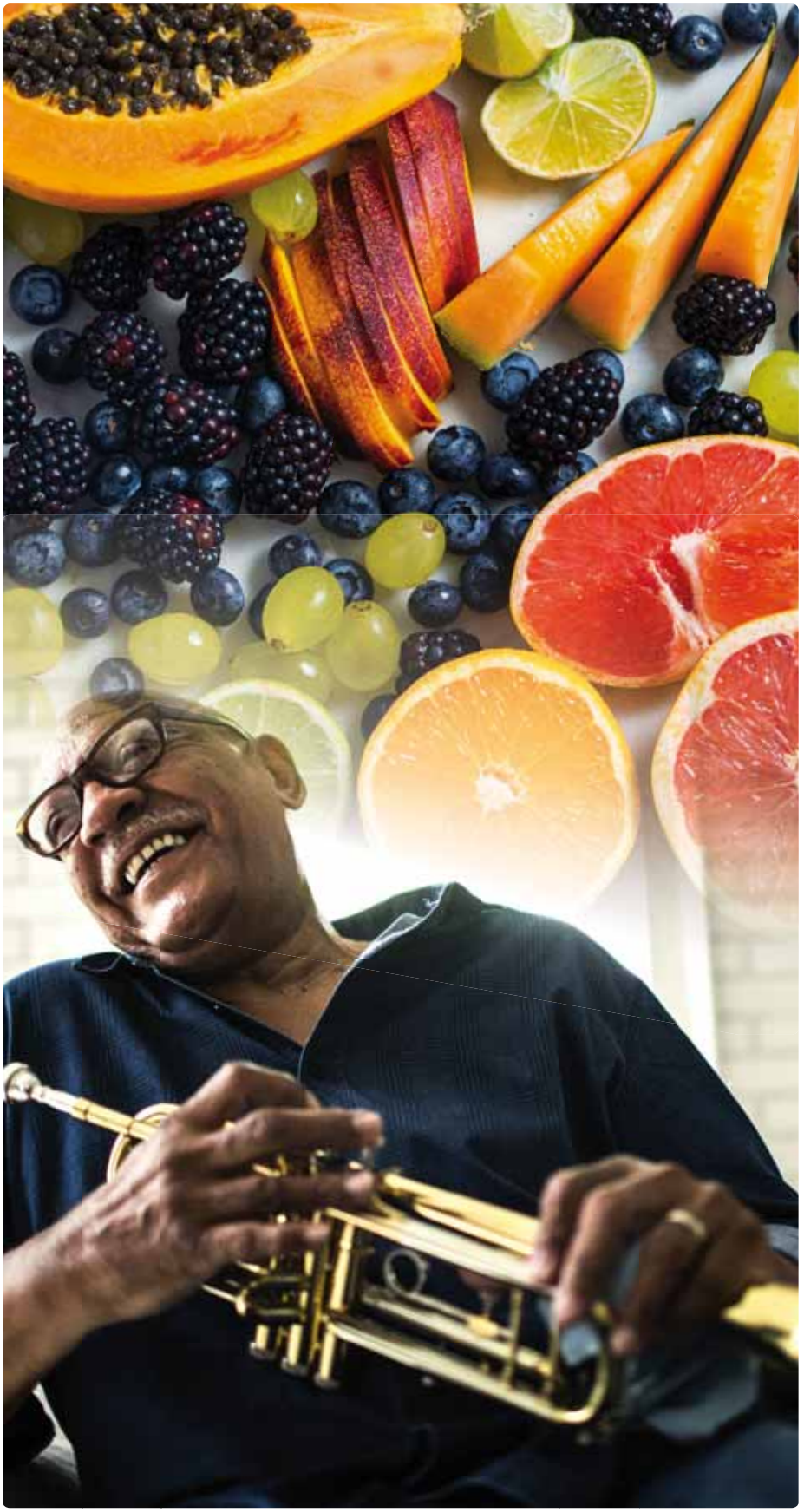
Cognitive function was evaluated **20.2 years** after the beginning of the study in 1993.

Among those whose Comprehensive Dietary Antioxidant Index Scores placed them among the top **25%** of participants, the odds for developing cognitive impairment were **16%** lower than those of participants with the lowest **25%** of scores.

For participants in the highest quartile for Vitamin C Equivalent Antioxidant Capacity, the odds for developing cognitive impairment were **25%** lower compared to those in the lowest quartile.

Editor's Note: When antioxidant nutrients were individually analyzed, greater daily intake of **vitamin C**, **vitamin E**, **carotenoids**, and **flavonoids** was associated with a reduced cognitive impairment risk.

* *J Gerontol A Biol Sci Med Sci.* 2021 Apr 7.



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- Enhances brain wave activity[4]

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An average cup of green tea contains about **150 mg** to **300 mg** of **polyphenols**.[5] Each capsule of this supplement provides **725 mg** of green tea extract, standardized to **98%** polyphenols. That means you'd have to drink about **3 cups** of green tea to get the same amount of polyphenols as one capsule of **Mega Green Tea Extract**.

Mega Green Tea Extract Decaffeinated

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1 bottle **$22.50**

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Mega Green Tea Extract Lightly Caffeinated

Item #00953 • 100 vegetarian capsules

1 bottle **$22.50**

4 bottles $18 each

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* **EGCG** is the acronym for **epigallocatechin gallate**, which is the polyphenol in green tea that has demonstrated the most robust health benefits.

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Unique PROBIOTIC Prevents Constipation

BY MICHAEL DOWNEY

Anyone who's suffered from occasional **constipation** knows how unpleasant it can be.

Roughly **20%** of Americans suffer from **chronic constipation**, which lasts for *several weeks* or longer.[1,2]

This is more than a quality-of-life problem. Chronic constipation can lead to hemorrhoids, anal fissures, and other health risks.[3-5]

As we age, the odds of developing constipation double.[3]

Conventional approaches with **fiber** do not always enable one to achieve desired improvement.[6]

A **probiotic** strain has been identified that offers a different approach.[7]

In a clinical trial of patients with **moderate constipation**, daily use of this **probiotic** strain restored **colonic transit time** to normal in just two weeks.[7]

That led to an average:[7]

- **42%** decrease in constipation
- **48%** decrease in nausea
- **52%** decrease in abdominal pain

Constipation has a wide range of underlying causes.

This novel **probiotic strain** may provide a solution for many individuals challenged to achieve satisfactory evacuation of their bowels.

When Constipation Becomes a Danger

Most people experience **constipation** (infrequent or difficult bowel movements) once in a while.

But for some, it has become a **chronic** condition.

Research has found that **chronic constipation** poses long-term health risks, including **hemorrhoids**, **anal fissures**, and possibly, **gallstones**.[3-5,7]

It has also been associated with a greater risk of **cancer**. Researchers have found a few possible reasons for the link:[5]

- People suffering from chronic constipation have a slow **colonic transit time** (the period it takes for stool to move through the colon).[8,9] That can prolong the contact between **stool carcinogens** and the tissue lining the colon.
- Constipation contributes to an unfavorable gut **microbiota** (the community of microbes living in the intestine). This may lead to **microbial toxins** disseminating to other parts of the body, contributing to cancer development or progression.
- An unbalanced gut microbiota is linked to **inflammation**, which increases risk of various cancers.

A Solution

The risk of developing **chronic constipation** increases with age.[3]

Researchers focused on **probiotics** as a possible solution.

These beneficial bacteria have been shown to have a range of benefits, from improving general digestive health to supporting healthy immune function, and much more.

Scientists carefully examined more than **2,000** probiotic strains, hoping to identify ones that provided these wide-ranging benefits.[10]

They found several strains derived from **yogurts** produced in New Zealand that had probiotic value *and* the ability to survive conditions similar to those in the human digestive tract.[10]

Eventually, scientists showed that one **specific strain** decreased **colonic transit time**.[7]

By moving stool along **faster**, this probiotic can provide relief for existing chronic constipation and help to prevent it from developing.

This breakthrough probiotic strain is ***Bifidobacterium lactis* HN019**.

Validated in Rigorous Clinical Trial

Scientists set out to test ***B. lactis* HN019** in a randomized, placebo-controlled, **triple-blinded** clinical study.[7]

Triple blinding means that no one involved in the study *in any way* is allowed to know which treatment is active and which is a **placebo**.

Researchers divided 88 men and women (ages 25-65) who suffered from **moderate constipation** into three groups.[7]

One was given **1.8 billion** colony-forming units (CFU) of ***B. lactis* HN019** once daily. A second was given **17.2 billion** CFU of ***B. lactis* HN019** once daily. A third group was given a placebo.

At the end of **14 days**:[7]

- Subjects who took a **low dose** (**1.8 billion CFU**) of ***B. lactis* HN019** had colonic transit times that were **18.5 hours** faster, a **31%** improvement.
- Subjects who took a **high dose** (**17.2 billion CFU**) of ***B. lactis* HN019** had colonic transit times that were **28.1 hours** faster, a **57% improvement**. This means that these individuals went from the slower than normal colonic transit times typical of moderate constipation to values considered to be in the normal range.

Digestive discomfort questionnaires were also completed by participants. The **high-dose** (**17.2 billion CFU**) probiotic recipients reported, on average:[7]

- A **52%** decrease in abdominal pain,
- A **48%** decrease in nausea, and
- A **42%** decrease in constipation.

Taking this probiotic was shown to be completely safe and did not result in any adverse effects, which mirrors the findings of other studies involving ***B. lactis*** **HN019**.[7]

Comparing This Probiotic to a Drug

Scientists compared the **57% improvement** in **colonic transit time** of this **probiotic** to a prescription constipation medication called **prucalopride**.

They reviewed previous clinical studies of **prucalopride**, which lasted from **four to 12 weeks** longer than the two-week probiotic study.[9]

The reviewers found that **prucalopride** improved colonic transit times by **19%**,[9] far less than the **57%** improvement seen in the high-dose **probiotic** trial.

The drug **prucalopride** has also been associated with a number of **side effects**, including headaches, abdominal pain, nausea, and diarrhea.[11]

How It Works

Studies have cast some light on how ***Bifidobacterium lactis*** **HN019** may reduce colonic transit time.[7,12-15]

This probiotic acts on food in the digestive tract to create metabolites known as **short-chain fatty acids**.

These fatty acids are a source of **energy** for cells lining the surface of the colon, making them essential to gastrointestinal health.

Preclinical models have demonstrated that short-chain fatty acids interact with a protein within certain cells that exist alongside intestinal **epithelial** (surface) cells. This sets in motion a cascade of events that speeds up **colonic transit times**.[7,12-15]

WHAT YOU NEED TO KNOW

Relief for Constipation

- The likelihood of developing **constipation** increases with age.
- In addition to reducing quality of life, **chronic constipation** is linked to serious health issues, including higher cancer risk.
- A specific probiotic strain, ***Bifidobacterium lactis*** **HN019**, has been found to target and treat constipation.
- Clinical research shows that oral use of *B. lactis* HN019 decreases **colonic transit time** by up to **57%**. In just ***two weeks***, that led to a **52%** decrease in abdominal pain, a **48%** decrease in nausea, and a **42%** decrease in constipation.

Another clinical study has shown *B. lactis* HN019 supplementation *increased* levels of two beneficial bacteria, **bifidobacteria** and **lactobacilli**, and *decreased* levels of harmful **enterobacteria**.[16] This may stimulate **peristalsis** (the muscle contractions that move food through the digestive tract) and shorten colonic transit time.[7]

Put simply, this probiotic strain helps move things along in the colon, which can effectively treat and prevent chronic constipation.

Summary

Chronic constipation afflicts about **20%** of Americans and about **40%** of those aged 65 and over.

Scientists have isolated a **probiotic** strain called ***Bifidobacterium lactis* HN019** from yogurt produced in New Zealand. This strain has been demonstrated to target and relieve constipation.

Clinical research has demonstrated that oral use of this probiotic decreases **colonic transit time** by up to **57%**, providing major relief from **constipation**.

Participants' regularity was considered normal after *just two weeks* of use.

Constipation has a wide range of underlying causes. This novel **probiotic strain** may provide a solution for many individuals who are unable to completely evacuate their bowels. •

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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† Colony Forming Units at time of manufacture.
1. *Scand J Gastroenterol.* 2011;46:1057-64.

LITHIUM Extends Lifespan and Slows Brain Aging

BY MICHAEL DOWNEY

During the past two centuries, people made pilgrimages to springs that were naturally high in the mineral **lithium**.

One site, **Lithia Springs** in Georgia, was visited by Mark Twain, at least *four* U.S. presidents, and other prominent figures, all because of the famous **lithium water**.

The more that scientists study **lithium**, the more persuasive the evidence has become for its unique effects.

Scientists have found that lithium may prevent **cognitive decline**.[1,2] Preclinical studies have shown it activates pathways that may slow the **aging process**.[3,4]

In one animal study, high doses of **lithium** increased median **lifespan** by **46%**.[5]

Two studies have found that individuals living in areas with even modest levels of lithium in drinking water tend to ***live longer***.[6,7]

As little as **300** to **1,000 mcg** of **lithium** daily may provide these benefits.

What is Lithium?

Lithium is a naturally occurring mineral found in rocks and subsoil in some geographical areas. Some natural water sources contain small amounts of this element.

By the 19th century, many people had come to believe that there were health and **longevity** benefits to drinking water that contained lithium. It also became linked to improved **mood**.

Modern science has confirmed these beliefs.

For instance, two studies found that people living in areas with even **low levels** of lithium in the drinking water tend to ***live longer***.[6,7]

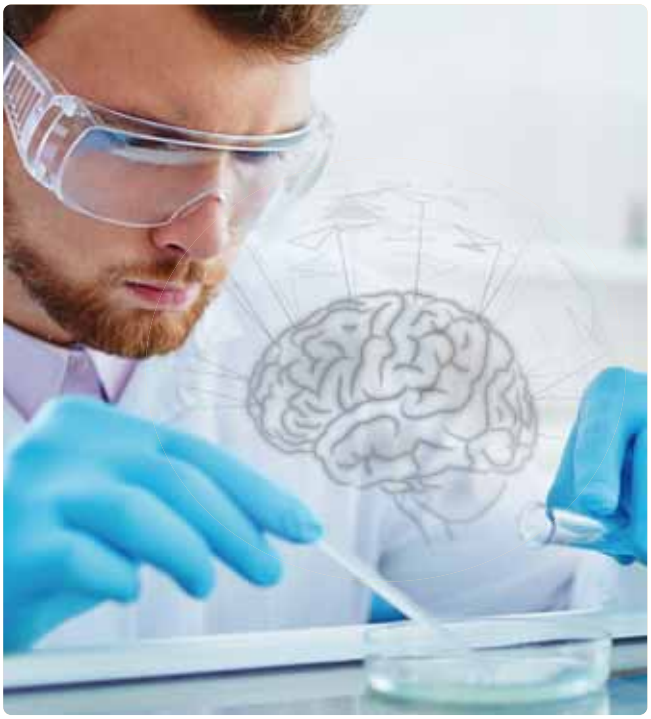
Lithium and the 'Age-Accelerating Enzyme'

One key to lithium's benefits appears to be its ability to *inhibit* a cellular *enzyme* called **glycogen synthase kinase-3** (**GSK-3**).[3,4,8]

GSK-3 controls several important functions within cells. But ***overactivity*** of GSK-3 can be harmful.

Increased GSK-3 activity correlates with **rapid aging** of many tissues and the entire body.[9,10] Its impact is so dramatic that GSK-3 can be thought of as an **age-accelerating** *enzyme*.

Overactivity of GSK-3 is linked to **chronic diseases**, including Alzheimer's, type II diabetes, some cancers, and mood disorders.[4,11-14]



Even in low doses, lithium ***reduces*** GSK-3 overactivity.[3,4,8]

Studies suggest that this **GSK-3 inhibition** is largely responsible for lithium's ability to protect brain function and promote healthy longevity.[3,8]

Boosting Longevity

Scientists have noted that people taking **high-dose lithium** for medical reasons generally have ***lower mortality rates***, including lower rates of death due to **cardiovascular disease**.[15,16]

Controlled experiments have been conducted to rigorously explore possible life-extending effects of lithium.

These studies showed that **low-dose lithium** led to a modest **increase in lifespan** in roundworms, known as *C. elegans*.[7]

Higher doses of lithium led to longer lifespans in both roundworms and fruit flies.[3,5,7] In one of these studies, median survival was boosted by **46%**.[9]

Evidence from these and other studies suggested that, in addition to inhibiting GSK-3, lithium exerted **pro-longevity** effects in three ways:[5,17,18]

- Lithium may help maintain longer **telomeres**, protective structures related to cellular health,
- Lithium regulates **genes** related to healthy **DNA structure**, and
- Lithium may protect against **cell senescence**. Senescent cells are contributors to age-related disease and accelerated aging.

Together, these mechanisms may help slow the aging process and protect against chronic disease.

Protecting the Brain

Very *high* doses of lithium have long been used to treat the psychiatric condition **bipolar disorder**.

Now, clinical studies suggest that much *lower* doses of lithium provide **neuroprotective** benefits.

Scientists are finding that lithium may help prevent or improve mood disorders, dementia, and Alzheimer's disease.

One study found that long-term lithium exposure from drinking water may be associated with a *lower* risk of being diagnosed with **dementia**.[19]

Similar benefits have been demonstrated with **Alzheimer's disease**.

One epidemiological study in Texas revealed that rates of death from Alzheimer's were *higher* in areas with *low* levels of lithium in the water.[20]

In one clinical study, a micro-dose of just **300 mcg** of lithium daily was found to ***significantly*** decrease ***cognitive decline*** in Alzheimer's patients, compared to a placebo.[21]

Mechanisms of Neuroprotection

Lithium appears to protect the **brain** in a number of different ways.

In preclinical research, scientists found that it not only reduces the elevated **GSK-3 activity** associated with **Alzheimer's**, but *also* reduces the buildup of **beta-amyloid**. This is the abnormal protein that accumulates and forms plaques in the brains of Alzheimer's patients.[22]

Scientists have also documented that lithium:[8]

- Increases the activity of multiple beneficial **neurotransmitters** in the brain,
- Increases **brain-derived neurotrophic factor**, an important signaling molecule that protects brain cells and augments their function, and
- Helps balance **circadian rhythm** and may help with **adrenal hormone** function.

In clinical studies, lithium treatment has been linked to additional signs of **neuroprotection**, including:[23]

- Thickening of the **cerebral cortex**, the brain's outer layer,
- Increased density of **gray matter**, which contains most of the brain's nerve cell bodies, and
- Enlargement of the **hippocampus**, the brain's memory center.

All of these activities together may slow brain aging and protect against cognitive decline.

WHAT YOU NEED TO KNOW

Lithium's Brain *and* Body Benefits

- Studies have found that people living in areas with the mineral **lithium** in the drinking water tend to live longer.
- Patients taking lithium for medical reasons also have **lower mortality rates**, and lithium treatment extends **lifespan** in animal studies.
- Lithium in drinking water may also be associated with a *lower* risk of being diagnosed with **dementia**.
- In a clinical study, **300 mcg** of lithium daily ***significantly decreased cognitive decline*** in patients with Alzheimer's disease.
- Lithium appears to work largely by *inhibiting* overactivity of the "age-accelerating enzyme" **GSK-3**, which has been tied to rapid aging, cognitive decline, and risk for chronic diseases.
- **Low-dose lithium** may reduce risk for age-related disorders, protect brain function, and extend healthy lifespan.

Summary

The mineral **lithium** is demonstrating broad-spectrum health benefits.

Lithium works, in part, by inhibiting the overactivity of the "age-accelerating enzyme" **GSK-3** and protecting DNA.

Lithium intake is associated with **longer lifespan** in humans and a median **46%** increase in longevity in roundworms.

In a clinical study, it decreased cognitive decline in patients with **Alzheimer's disease**.

Research shows that low lithium doses—only **300 mcg** to about **1,000 mcg** daily—may benefit mental and physical health and increase longevity. •

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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Topical **CoQ10** for Younger-Looking Skin

BY ROBERT GOLDFADEN AND GARY GOLDFADEN, MD

Oxidative stress damages delicate cell structures and diminishes the skin's capacity for **self-renewal**.

Scientists have found that topically applied **coenzyme Q10** helps **repair** this damage and reverse some of the outward effects of time.

Oxidative Stress Accelerates Skin Aging

When we're young, skin uses its own natural supply of **antioxidants** to counter oxidative stress.[1,2]

But **aging** and **chronic sun exposure** *deplete* the skin's antioxidant reservoir.[3,4]

Oxidative stress left unchecked results in inflammation,[5] damaged lipids,[6] dysfunctional mitochondria,[7] glycated proteins,[6,8,9] and mutated DNA.[6,10]

This compromises the growth and maintenance of youthful skin cells.

Over time, visible signs of premature aging appear, including **wrinkles** and **sagging skin**.

Coenzyme Q10

Coenzyme Q10 (CoQ10) is a lipid-soluble compound found throughout the body.

In skin, it is present mostly in the outermost layer. There, it acts as an **antioxidant**, reducing oxidative stress, inflammation, and DNA damage.[11,12]

In one study, pretreating human skin cells with CoQ10 before exposure to ultraviolet radiation decreased DNA damage by up to **70%**, prolonging cell survival and protecting against **skin cancer.**[12]

CoQ10 is used by the **mitochondria**, the power plants of cells, to produce the primary energy source used for skin maintenance and repair.[13,14]

Human skin cells treated with CoQ10 show *increases* in energy metabolism.[15,16]

In a preclinical study, CoQ10 promoted the healthy proliferation of normal and aged **fibroblasts**.[17]

Fibroblasts are cells that make **collagen** and the skin's extracellular matrix. Collagen is essential to maintain skin structure and integrity.[12,17,18]

CoQ10 also prevents **collagen** from being degraded by inhibiting the enzyme **collagenase**.[12]

Together, these beneficial effects diminish the appearance of unsightly **wrinkles**.

In one clinical trial, 20 mature participants with photodamaged skin topically applied **CoQ10** around one eye and a **placebo** around the other eye, once daily.

After six months, there was a **27%** reduction in mean **wrinkle depth** on the CoQ10-treated side, compared to the control side.[12]

Another clinical study also showed that **topical CoQ10** reduced **wrinkle grade scores**, compared to baseline.

Goji Berry Extract

Skin **stem cells** secrete **exosomes**, which shuttle information and material to other skin cells.[19]

Exosomes signal **fibroblasts** to produce new **collagen** and **elastin** that give skin its firmness and elasticity.[19]

As we age, the number and function of skin stem cells decline.[20] This leads to a loss of collagen and elastin, resulting in **wrinkles** and **sagging**.

***Lycium barbarum* (goji berry)** is a fruit-bearing plant that grows in Europe and Asia.[21]

When aged human skin **stem cells** are treated with an extract of ***Lycium barbarum***, they show *increased* vitality, exosome production, and greater activity of collagen-elastin gene expression.[22]

In one clinical trial, compared to placebo, topical use of *Lycium barbarum* stem cell extract reduced **wrinkle** depth and decreased facial **sagging**.[22]

Orchid-Derived Stem Cells

Calanthe discolor is a species of **orchid** native to Asia. Its **stem cells** have been shown to increase the output of multiple **growth factors** in **skin** stem cells.[23]

These growth factors activate **tissue repair** and **regeneration**. In a lab study, *Calanthe discolor* (orchid-derived) stem cells:[23]

- Increased fibroblast proliferation by **220%**,
- Increased fibroblast migration by **144%**,
- Increased type I collagen (the most abundant kind) by **53%**, and
- Increased elastin by **81%**.

In a clinical study, 26 participants with aging facial skin topically applied ***Calanthe discolor* (orchid) stem cell** extract or a **placebo** once daily to the target area.

After 56 days, compared to the placebo, ***Calanthe discolor*** led to a:[23]

- **17%** increase in skin firmness,
- **10%** increase in skin elasticity,
- **13.7%** increase in youthful skin glow,
- **15%** decrease in the number of wrinkles, and
- **12%** decrease in total wrinkle surface.

These improvements were accompanied by a lifting effect of the upper eyelids that rejuvenated the appearance of the **eyes**.[23]

WHAT YOU NEED TO KNOW

Three Nutrients to Repair Damaged Skin

- In the skin, **oxidative stress** damages cellular structures vital for cell renewal and repair.
- Over time, this results in **wrinkles** and **saggy skin.**
- **Coenzyme Q10 (CoQ10)** is an essential nutrient that protects against oxidative stress and increases energy metabolism in skin cells to enhance tissue regeneration.
- ***Lycium barbarum*** (goji berry) stem cell extract stimulates the activity of aged skin stem cells to reduce wrinkles, improve skin density, and decrease sagging.
- Stem cell extract from an orchid called ***Calanthe discolor*** increases the synthesis of growth factors in aged skin stem cells, boosting output of **collagen** and **elastin**, the proteins that keep skin firm and healthy.
- All three of these compounds have been combined into **one topical formula** to create firmer, more youthful-looking skin.

Summary

Oxidative stress accelerates **skin aging**.

Research shows that **CoQ10** and **stem cell extracts** from two plants, ***Lycium barbarum*** and ***Calanthe discolor***, help protect against oxidative stress and repair the damage it inflicts.

The result is reduced **wrinkle depth** and less skin **sagging**.

All three compounds have been combined into a **topical formula** to enable visibly firmer, younger-looking skin. •

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

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.

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Promising Strategies in the Fight Against **Pancreatic Cancer**

BY DAVID MARCUS

Pancreatic cancer is on the rise. The number of cases and deaths are increasing year after year.[1,2]

In 2018, there were **458,000 new cases** diagnosed and over **432,000 deaths** due to pancreatic cancer globally.[3]

The prognosis for most cases of **pancreatic cancer** is dismal. At time of diagnosis, **80%** of patients have locally advanced or metastatic disease.[4]

It is extremely aggressive and often resistant to treatment.

There is a desperate need for new treatments.

In the meantime, healthy dietary and lifestyle choices can significantly reduce one's risk of contracting this deadly malignancy.

What Is the Pancreas?

The **pancreas** is an organ located in the abdomen, near the stomach and small intestine.

It plays two major roles.

Exocrine tissue in the pancreas produces a liquid that enters the small intestine through **ducts**. This liquid and its *enzymes* aid in **digestion**.

It is from these ducts that most pancreatic cancers arise.

The pancreas also contains **endocrine** tissue. These cells produce hormones, including **insulin**, which are released into the bloodstream and **regulate blood sugar** levels.

Why Pancreatic Cancer Is So Deadly

Pancreatic cancer is only the **11th** most-common cancer in the U.S. But it's the ***third-leading cause of U.S. cancer deaths***.[5]

The overall five-year survival rate for pancreatic cancer is only 1**0%**. Survival depends on how *early* the cancer is caught and treated. When caught early, the five-year survival rate can be close to **40%**.

Unfortunately, more than half of all pancreatic cancers aren't diagnosed until the disease has metastasized. The five-year survival rate for these patients is a frightening **3%**.[2]

There are three main reasons why this form of cancer is so deadly.

First, early pancreatic cancers often do not cause symptoms. That means the tumor can continue growing unnoticed for a long time.

Second, pancreatic cancers are ***aggressive***. They grow rapidly and quickly invade nearby tissues. They also **metastasize**—spread through the bloodstream or lymphatic system—to distant organs or tissues quite easily.

Third, pancreatic cancers are notoriously ***difficult to treat***. Only the earliest, localized tumors can be effectively treated with surgery.[1] In advanced stages, pancreatic cancer tends to be long-term resistant to chemotherapy drugs and radiation.

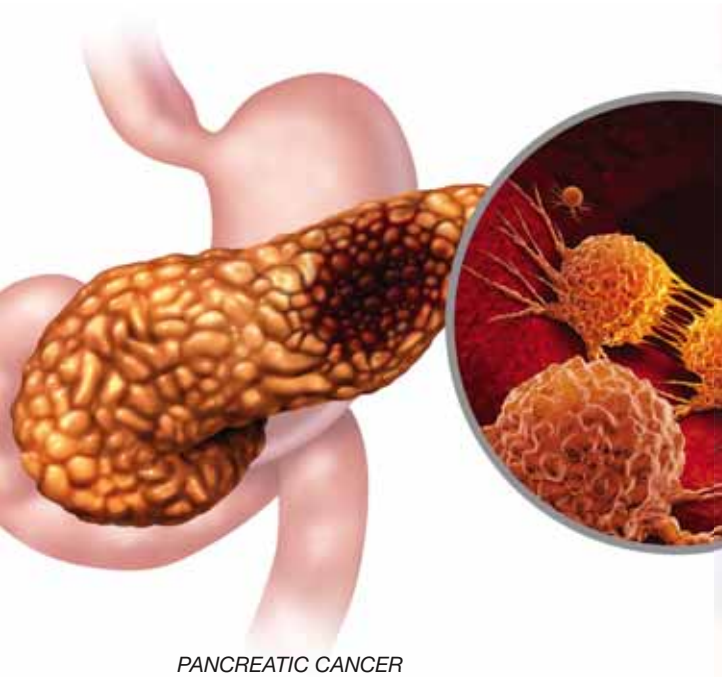
Lowering Risk Factors

There *are* some known ways to lower the risk of developing pancreatic cancer.

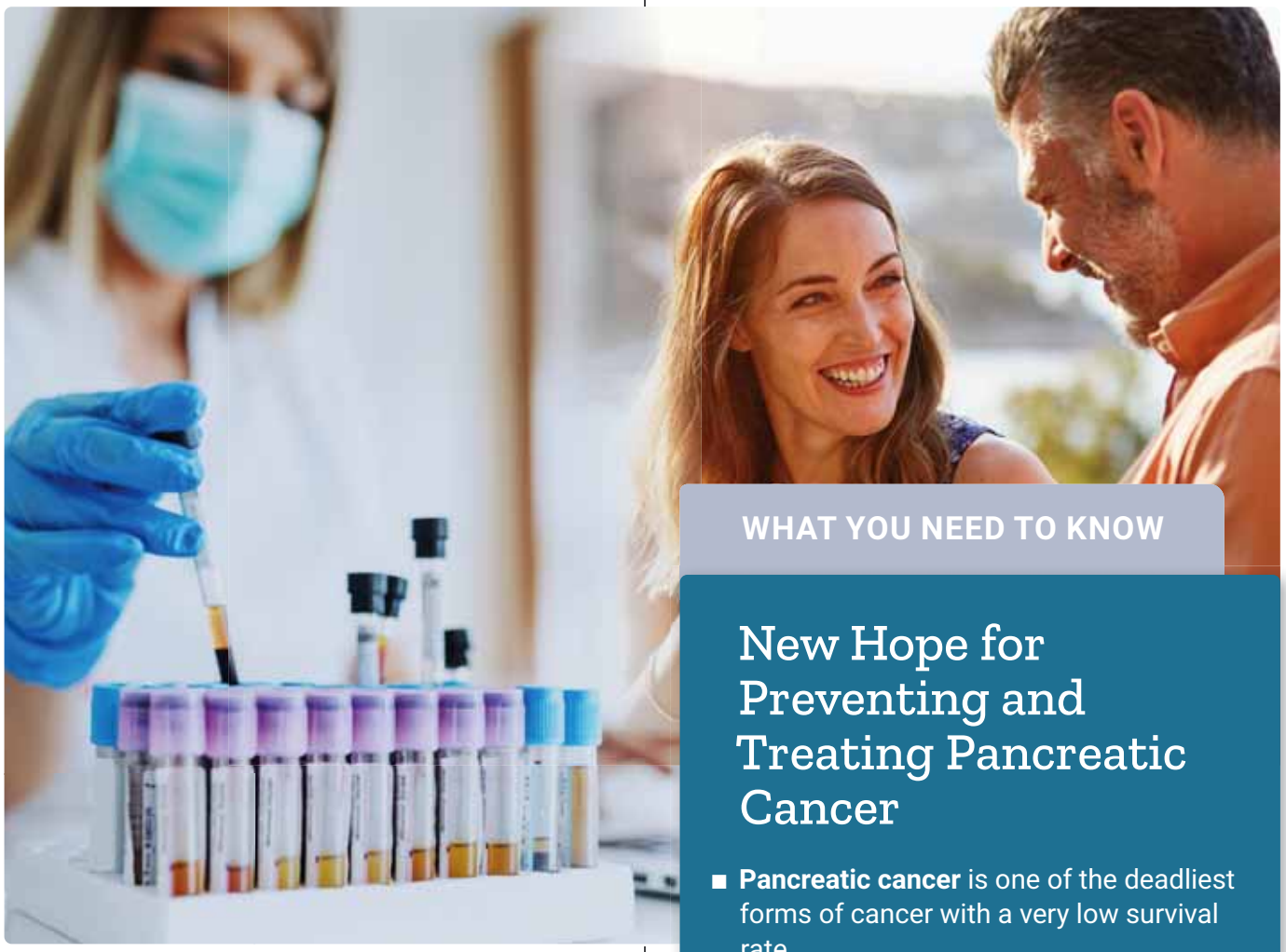
Poor diet, excessive alcohol intake, smoking, obesity, diabetes, and certain nutrient deficiencies have been identified as factors that increase risk for cancers.[1,4,6,7]

For example, compared to never-smokers, pipe smokers have a **1.6-fold** greater risk of developing pancreatic cancer than non-smokers, and cigarette smokers have a **1.5-fold** greater risk of developing pancreatic cancer.[8]

Recent onset of **diabetes** is associated with a **four-to-seven-fold** greater risk of developing it within three years of diagnosis.[9]



PANCREATIC CANCER



Heavy drinking and diets high in animal fats and **saturated fats** also significantly increase the risk of pancreatic cancer.[7]

Quitting smoking, improving diet, losing weight, and controlling blood sugar all help ***lower the risk*** of developing different types of malignancies, including pancreatic cancer.

Inadequate intake of various nutrients commonly found in fruits and vegetables also contributes to cancer risk. Studies show that *high* intake of these foods *reduces* risk of pancreatic cancer.[6]

Protective Nutrients

Several **nutrients** and **vitamins** have indicated protective properties against pancreatic and other cancers.

These are often lacking in standard American diets. **Supplemental intake** of these compounds can correct deficiencies and raise levels to more beneficial amounts.

WHAT YOU NEED TO KNOW

New Hope for Preventing and Treating Pancreatic Cancer

- **Pancreatic cancer** is one of the deadliest forms of cancer with a very low survival rate.
- Cancer of the pancreas is aggressive and highly resistant to standard treatments in most cases.
- Curcumin, omega-3 fatty acids, carotenoids, green tea catechins, and magnesium may reduce the risk of developing pancreatic cancer *and* improve treatment in patients who already have it.
- The diabetes medication **metformin** and cholesterol-lowering **statin** drugs have also shown an ability to reduce the risk of and improve survival in pancreatic cancer. Both are being studied further and may come to be a part of standard treatment.

CAROTENOIDS

The **carotenoids** are a group of nutrients found in fruits and vegetables.

The most studied as it relates to risk reduction are **alpha-carotene**, **beta-carotene**, **lycopene**, **astaxanthin**, **lutein**, and **zeaxanthin**.

Most of the carotenoids, either alone or in combination, have remarkable impact on various aspects of health. Numerous studies have drawn a link between carotenoid intake and prevention of cancer.[10,11]

Cell studies show that some carotenoids reduce pro-inflammatory signaling in cancers and induce cell death by apoptosis.[12]

A number of epidemiological studies have evaluated whether intake of carotenoids impacts risk for pancreatic cancer. Most of the common carotenoids have been shown to be associated with reduced pancreatic cancer risk, including alpha- and beta-carotene, vitamin A, lycopene, lutein, and zeaxanthin.[13-17]

For example, men with the *highest* intake of lycopene were **31%** less likely to develop pancreatic cancer than men with the lowest intake.[17] Beta-carotene and zeaxanthin intakes (highest vs. lowest) have been associated with a reduced risk of **48%** and **47%**, respectively.[16]

Even in existing cancer, carotenoids provide benefits. For instance, in pancreatic cancer cells that have become resistant to chemotherapy, **astaxanthin** blocked the cancer cell progression and increased their sensitivity to chemotherapy, aiding in killing of the cancer cells.[18]

CURCUMIN

Curcumin is the active compound found in the spice **turmeric**. It has been shown to act against cancer by several different mechanisms, affecting cancer cells at multiple points in their development.[19]

Studies in cell cultures and animals demonstrate that curcumin has the ability to inhibit pancreatic cancer growth.[20,21]

It works by stopping the tumor from growing new blood vessels, essentially starving it of nutrients. It also has direct **toxic** effects in cancer cells, killing them while being healthy for normal cells.[20,21]

Curcumin also blocks the ability of cancer cells to migrate and spread, ***preventing metastases*** to other organs.[22]

One of the major hurdles in the treatment of pancreatic cancer is that it develops resistance to **chemotherapy**. The most commonly used chemotherapy drug, **gemcitabine**, often becomes useless after a short time because the tumor stops responding to it.

Curcumin has been shown, in a laboratory study, to ***turn off this resistance***, allowing chemotherapy to have a greater impact.[23]

If future preclinical and clinical studies confirm this result, curcumin could not only help to prevent pancreatic cancer, but also to improve its treatment in patients who do develop this deadly disease.

VITAMIN D

Vitamin D deficiencies are extremely common, especially in older adults. Inadequate levels of vitamin D have been found to be associated with increased risk for several chronic diseases, including cancer.

Research also suggests a positive association between vitamin D intake or status and lower total cancer risk and mortality.[24-26]

One analysis found that higher vitamin D intake (**600 IU**/day or more) was associated with a **41%** lower risk for pancreatic cancer when compared to the lower intake (less than **150 IU/day**).

Exposure to **sunlight**—which helps the body produce vitamin D—is also associated with a reduced risk of pancreatic cancer.[27-29]

GREEN TEA CATECHINS

Green tea and its extracts contain compounds called **catechins** that have numerous health benefits.

In observational studies, *higher* tea consumption is associated with *lower* risk of developing pancreatic cancer.[30-32] In one study in China, regular tea drinkers had a **51%** lower risk of pancreatic cancer compared to people who did not drink tea regularly.[32]

Like curcumin, green tea has direct effects on pancreatic cancer cells. In preclinical studies, it has been shown to reduce tumor cell growth, invasion, and migration, and to cause cancer cells to die off.[33,34]

Also, like curcumin, catechins increase the impact of **chemotherapy** drugs.

EGCG (epigallocatechin gallate) is the most common catechin in green tea. In one preclinical study, it reduced pancreatic cancer growth by **40%** on its own. The chemotherapy drug **gemcitabine** reduced growth by **52%**.

But ***together***, the two compounds ***reduced cancer growth by 67%***.[35] EGCG has shown this ability for other cancer cell types and with other chemotherapy drugs as well.[36]

OMEGA-3 FATTY ACIDS

Omega-3 fatty acids from **fish oil** act by numerous mechanisms to help fight a wide array of cancers.[37-39]

For example, abnormal activation of two key signaling proteins, **STAT3** and **NF-kB**, contribute significantly to the survival and growth of pancreatic cancer cells. Omega-3 fatty acids *suppress* their activity.[40]

In mice, omega-3s prevent the formation and viability of pancreatic cancer, while unhealthy fats *accelerate* tumor formation.[41,42]

In people, greater intake of omega-3 fatty acids, particularly **DHA**, has been associated with reduced risk of pancreatic cancer compared to lower intake.[43,44]

Omega-3s also work with other nutrients and medications.

The *combination* of **omega-3 fatty acids** and the cancer drug **gemcitabine** was found to completely block the secretion of a cancer growth factor called **platelet-derived growth factor** in pancreatic cancer cells.[45]

Combining **omega-3s** and **curcumin** has also been found to enhance the killing of pancreatic cancer cells.[46]

A review of trials that included omega-3 use in humans with advanced, terminal pancreatic cancer found that they helped to maintain body weight and approximately doubled ***patients' survival time***.[47]

MAGNESIUM

Magnesium is a critical mineral required for many different processes in the body, including metabolism. *Low* levels of magnesium contribute to many chronic diseases, particularly cardiovascular disease.[48,49]

There is mounting evidence that suboptimal intake of magnesium contributes to the development of **cancers** as well.

Magnesium is a required cofactor (or "helper molecule") for proteins involved in **DNA repair**.[48]

Without enough magnesium, DNA repair may be inadequate. This leads to more rapid accumulation of genetic mutations, which contribute to the development of cancer.

One large study found a clear association between magnesium intake and risk for pancreatic cancer.[50] The study followed more than **66,000** older adults for eight years.

Subjects were divided into in three groups based upon their magnesium intake as follows:

- **"Optimal" Intake**—These authors defined this as consuming greater than or equal to 100% of the government RDA for magnesium (**420 mg** a day for males and **320 mg** a day for females)
- **Sub-optimal Intake**—Daily intake of **75%** to **99%** of the government RDA for magnesium
- **Deficient Intake**—Less than **75%** of the government RDA for magnesium (less than **315 mg** a day for males and less than **240 mg** a day for females)

Compared to those with what the authors called "optimal intake," subjects with sub-optimal intake had a **42%** greater risk of developing pancreatic cancer. Those with ***deficient*** intake had a striking ***76% greater risk*** of pancreatic cancer compared with those with intakes greater than or equal to **100%** of the magnesium RDA.

Medications with Anti-Pancreatic-Cancer Effects

The standard pharmacologic treatment for existing pancreatic cancer is generally chemotherapy drugs, radiation, or a combination of both. They have little success.

Studies have found that patients who are taking two non-cancer medications, **metformin** or **statin** drugs, have some protection against the development and spread of this deadly cancer.

METFORMIN

Metformin is the most common drug used to control blood glucose levels in **type II diabetes**.

Research shows that metformin use in diabetics is associated with lower risk of developing pancreatic cancer.[51,52]

In a study of records of patients with pancreatic cancer and diabetes treated at the **University of Texas MD Anderson** cancer center, the two-year survival rate in those taking metformin was nearly **twice** that of patients not taking metformin.[53]

A large 2018 meta-analysis included nearly 4,300 diabetic pancreatic cancer patients, over 2,000 of whom had received metformin. This study found metformin use in diabetics with pancreatic cancer was associated with a **19%** reduced overall mortality risk compared to those who did not use metformin.[54]

And in a **2020** meta-analysis, compared to no use, metformin use was associated with overall better survival in patients who underwent surgery for pancreatic cancer.[55]

Human trials evaluating the role of metformin in treating pancreatic cancer are currently underway or recently completed.[56] Depending on the results, metformin may become a more standard component of cancer care.

STATINS

The **statins** are a group of drugs used to lower **cholesterol** levels, reducing risk of cardiovascular disease.

They work by inhibiting an enzyme important for the synthesis of cholesterol in the body.

Researchers have found that use of statin drugs lowers risk for **pancreatic cancer**, increases survival, lowers mortality, and inhibits its growth.[19]

In cell culture and animal models of pancreatic cancer, treatment with statins stunts the growth of cancer cells and prolongs survival of the animals.[19,57]

In one large study of over **12,000** older patients with pancreatic cancer, those who started statins after their diagnosis had a **31%** improved overall survival.[58]

Another study looked at the medical records of almost a ***half million*** veterans.[59] Statin use of six months or longer was associated with a ***67% lower risk*** of developing pancreatic cancer. And statin use for more than four years correlated with a reduction in risk up to **80%**.

Treatments for pancreatic cancer that include statins are currently being evaluated in five registered **clinical trials**.[60]

These medications and the many compounds that have shown anti-cancer properties offer new hope for ways to prevent and treat this lethal cancer.

Summary

Pancreatic cancer is one of the deadliest forms of cancer.

Treatment is rarely successful. But evidence shows that increasing intake of certain nutrients and healthier lifestyles help lower the risk of developing it and slow its growth in patients with the disease.

The best documented nutrients are:

- Carotenoids,
- Curcumin,
- Green tea catechins,
- Omega-3 fatty acids, and
- Magnesium.

In addition, the diabetes drug **metformin** and cholesterol-lowering **statins** have shown benefits in protecting against pancreatic cancer and in extending life in patients with pancreatic cancer. They have been studied in preclinical models, and are being tested in humans. •

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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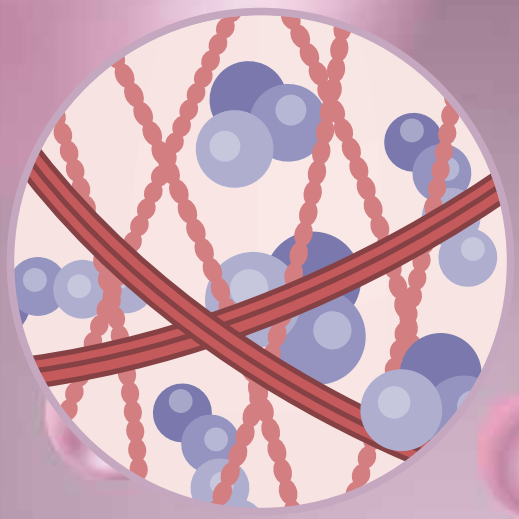
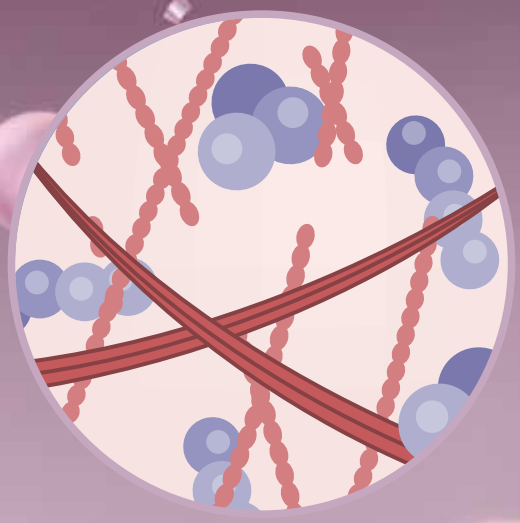
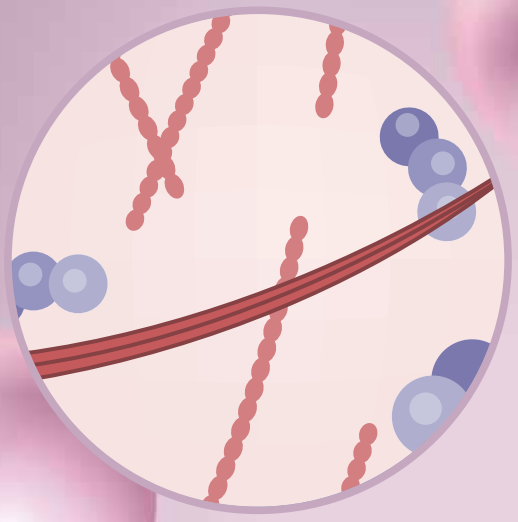
BY MICHAEL DOWNEY







Collagen is the main protein in all connective tissue in humans.

It's crucial for the health of our **skin** and **nails**.

With **age** and **sun** exposure, our production of **collagen** declines.[1]

The results are visible. Skin sags, develops wrinkles, and becomes marred by cellulite. Nails grow brittle and crack more easily.

To solve this problem, scientists developed **collagen peptides** that, when taken orally, stimulate the body to produce *new* **collagen**.

In clinical studies, these oral **collagen peptides**:[2-5]

- Reduce the volume of eye wrinkles by **20%**,
- Increase skin elasticity by an average of **7%**,
- Reduce cellulite scores by **9%**, and
- Decrease nail breakage by **42%**.

Our Body's Glue

Collagen is the most abundant protein in the human body. The word collagen comes from the Greek word *kola*, meaning "glue," and it is essentially the glue that holds the body together.

It's the main component of most connective tissues, such as tendons and muscle.

Collagen makes up **70%** of the subsurface layer of the skin by weight.[6] It is vital for skin cohesion, firmness, and resilience.[7,8]

It also provides flexibility and is integrated with fibers of **elastin**, the protein that allows the skin to stretch and return to its original shape.

Collagen Drops with Age

Aging has a devastating effect on collagen production.

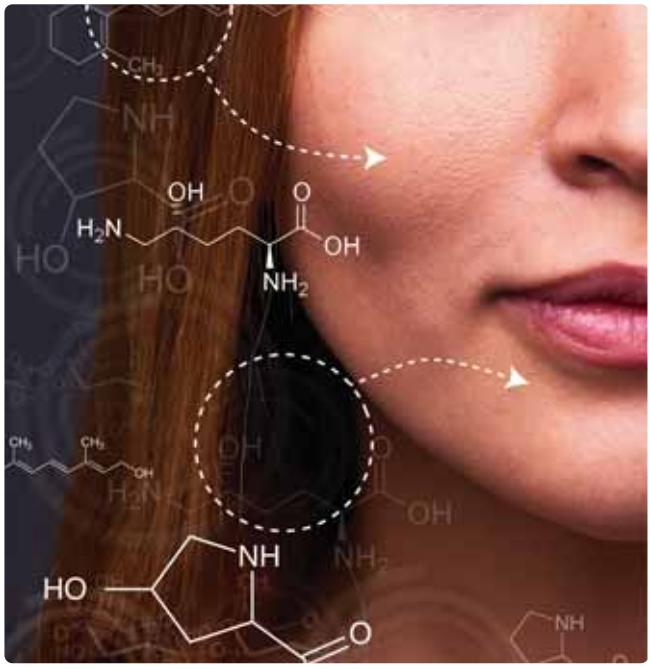
At around age **25**, the cells that produce collagen fibers slow down. The remaining fibers can stiffen, break, and lose shape. Elastin fibers also begin to fray and lose elasticity.

From then on, adults lose about **1%** of their skin collagen each year.[9] After several decades, you may have lost **half** the skin collagen you had at age **18**.[9,10]

Collagen decline accelerates even faster in women after **menopause**. Smoking, high blood sugar, and sun exposure also decrease collagen levels.[11-15]

The result of collagen loss is **visible skin aging**, including thinning, sagging, and wrinkles. [9,10]

But this doesn't have to be inevitable.



Peptides Stimulate New Collagen

Collagen peptides are short chains of amino acids that provide the building blocks for collagen.

In animal studies, scientists showed that hydrolyzed (or partially broken-down) collagen peptides boosted the creation and activity of collagen. This produces stronger, more supple skin.[16]

These collagen peptides also *reduce* the activity of an enzyme (***metalloproteinase 2***) that degrades collagen and hastens skin aging.[16]

Taken orally, these peptides stimulate the production of new collagen and elastin in the skin.[2]

Human trials have demonstrated that an oral collagen peptide is effective in improving skin appearance.[2,3]

Reduced Skin Wrinkles

Researchers conducted a series of **human trials** to test the effects of these collagen peptides on **skin** and **nails**.

In one clinical study, scientists gave oral **collagen peptides** to 114 women, aged 45 to 65, in daily doses of **2.5 grams**.[2]

After ***four weeks***, the volume of eye wrinkles in the collagen group had decreased by **7.2%**, compared with placebo recipients.[2]

After ***eight weeks***, those taking **collagen peptides** showed a stunning **20.1% reduction** in the volume of eye wrinkles.[2]

This research team also measured the structural proteins in the women's **dermal matrix**, the structural framework responsible for skin renewal and vitality. The more proteins, the healthier and more youthful the skin appears.[2]

The study found that subjects taking collagen had a **65% increase** in essential type-I **pro-collagen** and an **18%** increase in **elastin fibers**.

Increased Skin Elasticity

In another study, scientists tested the effect of collagen peptides on **skin elasticity**. This is the skin's ability to stretch and bounce back, rather than sagging.

One group of volunteers received **2.5 grams** of oral **collagen peptides** daily, a second group received **5 grams** daily, and a third received a placebo.

After eight weeks, *both* groups taking the collagen had an average **7% improvement** in skin elasticity.[3]

This improvement in skin elasticity was even *greater* in **women** over age 49.[3]

Remarkably, a treatment subgroup of elderly women still retained higher elasticity than the placebo group *four weeks after* the last dose was taken.[3]

Erasing Cellulite

Collagen was next tested on **cellulite**, the "orange peel" appearance of skin.

Cellulite is caused by fat under the skin bulging into the dermis due to collagen loss and the resulting matrix breakdown.

Restoring dermal architecture can *decrease* the appearance of cellulite by lessening the amount of fat showing through the skin.

Scientists enlisted 105 women, aged 25 to 50, with visible cellulite. One group received **2.5 grams** of oral **collagen peptides** daily. A second group received a placebo.[4]

After six months, collagen *reduced* cellulite by **9%** and decreased thigh-skin waviness by **11.1%**, compared to the placebo.[4]

WHAT YOU NEED TO KNOW

Oral Collagen Builds Healthier Skin and Nails

- **Collagen** supports connective tissue throughout the body. It keeps skin smooth, elastic, and youthful looking. It also helps keep nails strong and healthy.
- Starting at around age **25**, collagen production decreases by about 1% **per year**. This loss of collagen leads to wrinkles, sagging skin, cellulite, and brittle nails.
- **Collagen peptides** improve skin elasticity, reduce the size of eye wrinkles by as much as **20%**, and improve the appearance of cellulite.
- These oral peptides also decrease **nail** brittleness, reducing breaks by **42%** and restoring normal nail growth rate.

Using ultrasound scans of the skin, the researchers noted an evident improvement in dermal density in those who took the peptides. This indicates that the oral collagen helped restore the normal structure of the skin's layers.[4]

Stronger, Healthier Nails

Loss of collagen doesn't just affect the skin. It also results in brittle, ragged **nails**.

In a human trial, 25 healthy women, ages 18 to 50, were given **2.5 grams** of **collagen peptides** once daily for 24 weeks.[5]

The collagen peptides *decreased* the frequency of **nail breakage** by **42%**. They also reduced nail peeling and nail-edge irregularity, and *increased* the nail **growth rate** by **12%**.[5]

Overall, **64%** of participants had an improvement in **nail brittleness**. Four weeks *after treatment stopped*, the benefits were even more pronounced, with **88%** of participants showing significant improvement in nail brittleness.[5]

A whopping **80%** of participants agreed that the collagen treatment improved their nails' appearance and expressed complete satisfaction with the results.[5]

Along with the studies on skin, this result confirms that **oral collagen peptides** can improve the appearance and health of skin and nails.

Summary

After about age **25**, we begin to produce less **collagen**.

Over time, collagen loss results in wrinkled, sagging skin, cellulite, and brittle, breakable nails.

Collagen peptides can *boost* the synthesis of new collagen and elastin.

Clinical trials show that these peptides decrease eye wrinkle size by **20%**, increase skin elasticity, reduce cellulite, and strengthen nails. •

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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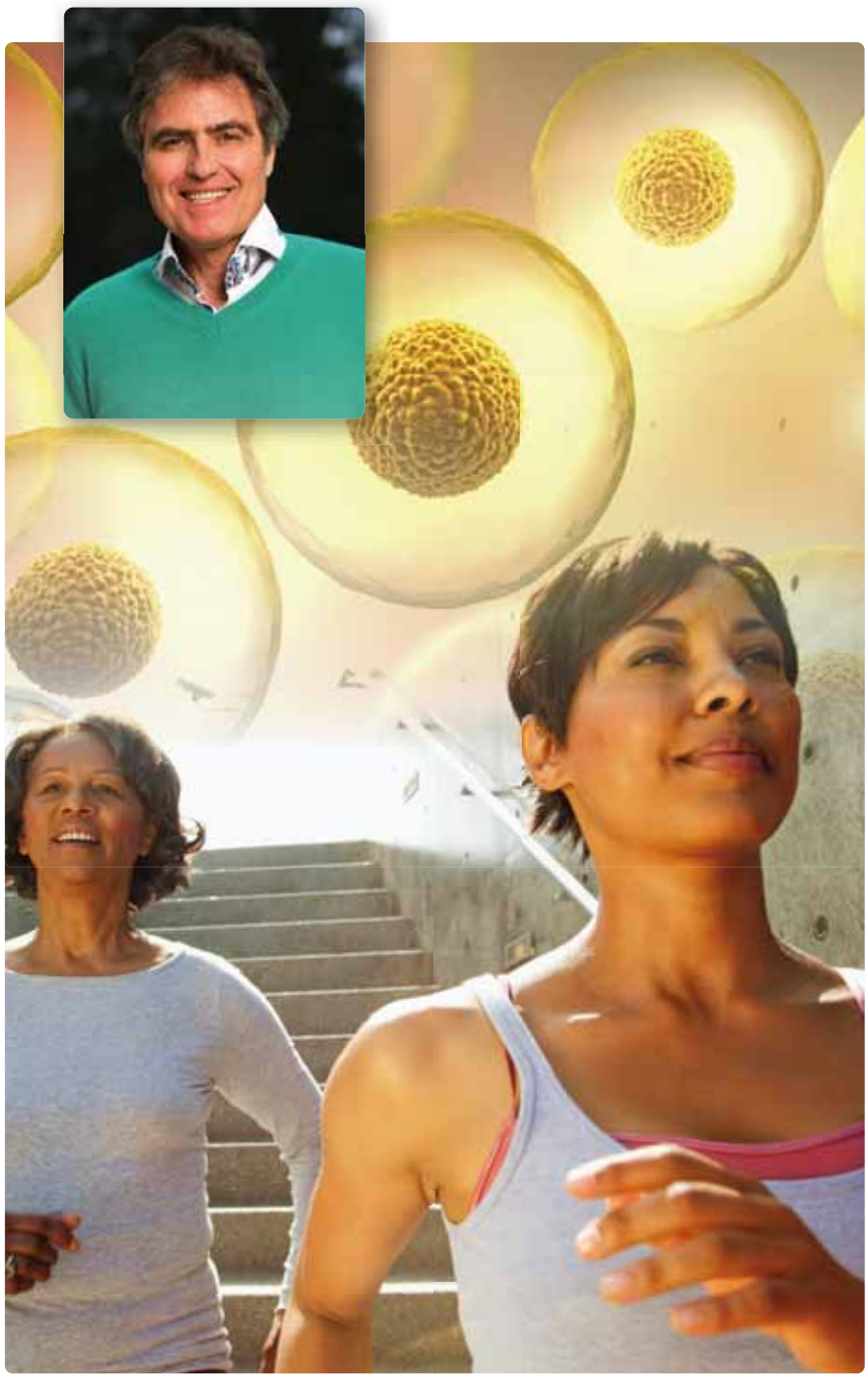
The Anti-Aging Power of Hormone Therapy

DR. THIERRY HERTOGHE



PART ONE

Dr. Thierry Hertoghe is one of the world's leading experts in and practitioners of hormone replacement therapy for longevity and disease prevention.

In this exclusive, two-part interview, **Dr. Hertoghe**, president of the International Hormone Society and the World Society of Anti-Aging Medicine, tells ***Life Extension***® how hormone therapy can help fight disease and promote longevity.

LE: In your practice in Belgium, you use **hormone replacement** to treat a number of disorders. Why do you think this type of therapy is often overlooked by mainstream medicine?

Dr. Hertoghe: Most doctors are trained to treat **consequences** of disease and not the cause. In contrast, most hormone therapies focus on preventing diseases and treating their causes. There are also scientifically unsubstantiated fears that hormone treatments could cause cancer or heart disease. But research shows that properly adjusted and well-balanced hormone treatments, at appropriate doses, are safe, and even protective.

There's also a widespread belief that hormone deficiencies are extremely rare and that treatments should be reserved for severe deficiencies only. But data from numerous scientific studies show that **low-to-normal** hormone levels are frequent and are associated with disease.

In addition, the science of optimal hormone replacement therapy is hardly taught in medical schools. My team and I have developed a high-level training program in "**evidence-based hormone therapy**" for physicians and nutritionists, which fills in these educational gaps.

LE: How do you use hormones to treat or prevent disease?

Dr. Hertoghe: I focus on detecting and treating any degree of hormone deficiencies or excesses, even mild ones. For each hormone supplementation, I try to find the dose and route of administration (oral, transdermal, intramuscular, or sublingual) that fits the patient and the treatment best. If the patient has heart disease, diabetes, osteoporosis, or any other type of age-related disease, I will adjust my treatment to that condition. I do not focus on treating a disease but focus on correcting the **hormone deficiencies** that cause or aggravate it. In most cases the disease improves.

LE: Can you explain your belief that hormones can alter aging?

Dr. Hertoghe: There is a gradual age-related decline of hormone production. That decline is aggravated by mental and physical stress, which causes the body to compensate with increased secretion of certain hormones, which then taxes the endocrine glands that secrete them. The more an endocrine gland has to produce hormones, the more likely and quickly the patient's gland is going to prematurely age and become unable to produce enough hormones to meet daily needs.

For example, take the **adrenal glands**, which produce hormones to cope with stress. If stress is too severe and persistent for many months, there is no possibility for the adrenal glands to recover. After overproducing hormones, the production of the adrenal glands will collapse and end up in what is called **adrenal burnout**. That means the adrenals are no longer able to produce enough hormones, even in *unstressed* conditions.

LE: How can hormone therapy prevent that from happening?

Dr. Hertoghe: Well-adjusted hormone therapies may spare endocrine glands, stopping them from having to overwork and prematurely age. For example, when **testosterone** is applied to male rats from youth to old age, the testicles are spared from overworking. When the testosterone treatment, which suppressed the rats' own production of testosterone, is stopped at old age, the testicles of the older rats secrete testosterone again—at levels *equal* to that of younger rats. Even the sperm production of these old rats recovers to a rate equal to that of young rats!

LE: What conditions do you treat with hormone therapy?

Dr. Hertoghe: The most frequent reasons patients come to see me are *psychological* complaints, such as **fatigue**, **depression**, and low resistance to **stress**. The most frequent *physical* complaint is to restore a more youthful physical appearance.

Then come age-related diseases, such as **cardiovascular disease**, **hypertension**, and **diabetes**. **Cancer** is a rarer condition for us to treat. That's not because of a lack of ability—we are able to stimulate the immune system of the patient considerably and improve health and energy levels—but because of the unjustified fear patients have of taking hormones.

The results we have seen on **age-related diseases** are very satisfying. Our treatments should be considered as adjuvant and complementary interventions to that of the patient's medical specialists. We cannot promise full recovery, but in many cases we seem to be able to help our patients come close to full improvement.

LE: Can you walk us through how you begin to treat a patient with hormone therapy?

Dr. Hertoghe: In our clinic, patients first fill out extensive questionnaires on their medical history and that of their family, and on about 15 hormone deficiencies or excesses. We also review the patient's diet in detail, which is of crucial importance. Many of the hormone treatments may not work well if the patient's diet is too far from the **Paleolithic diet**. This type of diet consists of eating the types of unprocessed foods that have existed on earth for millions of years, such as fresh and organic fruit and vegetables, unprocessed meat, fish, poultry, and eggs cooked at low temperature without oil.

Then we do laboratory tests. These are not only **blood tests**, which provide a snapshot of hormone levels, but also 24-hour **urine hormone tests**, which provide a more stable, 24-hour picture of what is happening with the hormones.

LE: What are the next steps?

Dr. Hertoghe: Based on this information, we start with hormone and nutritional supplementation, insisting that the patient also follow a Paleolithic-type diet for at least five out of seven days to guarantee full efficacy of hormone treatments. We also inform patients that it is more efficient, safer, and better to correct all their important deficiencies and not just one or part of them. Otherwise, treatments are unbalanced and less efficient.

Some treatments, such as **thyroid** and **growth hormone**, have to be started at very low doses and then slowly increased. Other treatments, such as **adrenal hormones** (DHEA, cortisol, pregnenolone, aldosterone), **sex hormones** (testosterone, estrogen, progesterone), and **melatonin**, may be started at the dose that is expected to be optimal. Patients are informed of signs and symptoms of deficiency and excess of each hormone treatment and encouraged to regularly check them. The patient is also seen in regular follow-ups.

LE: You mentioned that age and stress harm hormone production. What other factors impact hormones?

Dr. Hertoghe: Many environmental factors do. It is not wise to eat foods or drink beverages that contain pollutants. For example, research has shown that plastic subunits from the walls of **plastic water bottles** migrate into the liquid. These units have effects similar to estrogen.

Toxins in food, such as **trans fats** and the **polycyclic aromatic hydrocarbons** that appear in barbecued food, damage the endocrine glands and make them age faster. **Pesticides** in food may also be a problem because many of them have an affinity for sex hormone receptors and may block the beneficial effects of sex hormones.

Alcohol contains ***three*** types of estrogens: phytoestrogens, mycoestrogens, and estrogenic pesticides. These all oppose testosterone action. Additionally, alcohol speeds up the conversion of testosterone into estradiol in the liver, depleting testosterone in men and increasing estrogen levels to an excessive point.

LE: Do you think hormone therapy will become more accepted in the future?

Dr. Hertoghe: The most impressive advance in medicine in the next decades will come from a shift in focus from therapies that treat the *consequences* of disease to those that treat the causes. Doctors and patients will pay greater attention to **hormone** and **nutritional** therapies and use pharmaceutical drugs as *additions* in areas where hormone and nutritional supplementation are not sufficient. •

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

Part Two of this interview will continue in the September issue.

Dr. Thierry Hertoghe practices medicine at his clinic in Brussels, Belgium, where he specializes in using hormone treatments and nutritional therapies to fight disease, optimize health, and promote longevity. He is president of the International Hormone Society and the World Society of Anti-Aging Medicine.

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The Hidden Cause of the Autoimmune Pandemic and How to Get Healthy Again

BY DR. STEVEN PHILLIPS AND DANA PARISH

A pandemic of **autoimmune** and **chronic illness** is sweeping the globe, with **50 million** people diagnosed in America alone.

In their new book, Dr. Steven Phillips and his former patient, SONY/ATV singer-songwriter Dana Parish, argue that the true cause of autoimmune disease is **chronic, undiagnosed infections**.

These infections—from Lyme to toxoplasmosis—are caused by a broad range of microbes and lack a simple fix.

In the absence of medical consensus, Dr. Phillips has created innovative treatment strategies to combat these infections. These include using a technique called "pulsing"—along with natural compounds like **oil of oregano, grapefruit seed extract** and **probiotics**.

Both Dr. Phillips and Parish nearly died of undiagnosed infections, and now they are on a mission to help prevent others from having the same experience.

In this interview with ***Life Extension®***, Dr. Phillips and Parish delve deeper into this surprising connection—and Dr. Phillips shares some of his techniques for effectively treating these insidious infections.

—LAURIE MATHENA

LE: What is the connection between infections and autoimmune diseases?

Dr. Phillips: It's striking to us that chronic autoimmune diseases are considered to be of unknown origin, yet so many have been linked in medical literature to infections, specifically Lyme and *Bartonella*.

When people receive a diagnosis of fibromyalgia, MS, lupus, rheumatoid arthritis, Sjogren's, psoriatic arthritis, or another rheumatologic/inflammatory diagnosis, they are not getting an actual diagnosis, but rather a description of signs and symptoms that brings them no closer to an answer.

According to a survey of over 4,000 chronic Lyme patients, roughly **20%** were initially misdiagnosed with one of the following serious neurologic diseases: MS, Parkinson's, ALS, or Multiple Systems Atrophy.

Many doctors are not properly (and sometimes not at all!) evaluating these patients for the possibility of infections and it's disgraceful.

LE: What exactly is Lyme?

Dr. Phillips: To say Lyme is a "tick-borne illness" overly simplifies the matter. The word "Lyme" has come to refer to a family of infections, referred to here as "Lyme+"—and the transmission of these germs is not just by ticks. [Some of these bacteria] can be transmitted by other bugs like fleas, lice, sand flies, spiders, and ants.

LE: What are some examples of conditions often linked to—and caused by—infections associated with Lyme+?

Dr. Phillips:

- Fibromyalgia
- Chronic fatigue syndrome
- Multiple sclerosis
- Rheumatoid arthritis
- Spondyloarthropathy—psoriatic arthritis, spondylitis
- Psoriasis
- Lupus
- Mixed connective tissue disease
- Migraines
- Inflammatory bowel disease, i.e., Crohn's and ulcerative colitis
- Irritable Bowel Syndrome (IBS)
- Interstitial cystitis, bladder symptoms
- Psychiatric illness (e.g., depression, anxiety, OCD, bipolar disorder, and psychosis)
- Dilated cardiomyopathy
- Neurodegenerative diseases including ALS (Lou Gehrig's disease), Alzheimer's disease, Parkinson's disease, and Lewy body disease

LE: That's a shocking list. How could Lyme be mistaken for something like multiple sclerosis?

Dr. Phillips: Lyme can be clinically indistinguishable from multiple sclerosis, a fact that has been documented for decades.

Before the 1950s, spirochetes were visualized in the brains of MS patients and found from their spinal fluid. As documented in the *Official Journal of the California Medical Association* by a group of Stanford-based researchers, they named these organisms *Spirochaeta myelophthora*.

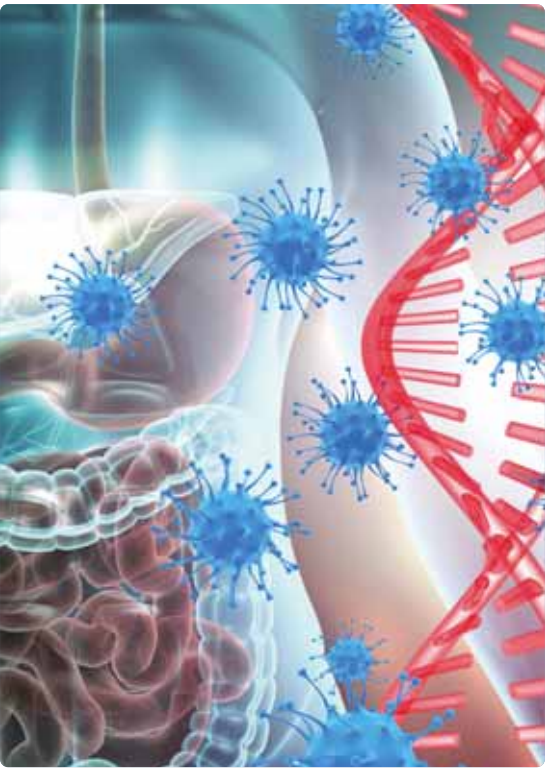
After that, a series of inoculation studies demonstrated that the tissue from the central nervous system of MS patients could be contagious. When lab animals were injected with this tissue, they became infected—their immune systems became inflamed and neurologic illness followed, sometimes resulting in paralysis and death.

In a 2001 study done in Norway, when researchers looked for infectious agents in the cerebrospinal fluid of MS patients, they found *B. burgdorferi* cysts in all of them, but not in healthy controls, with the exception of one, who had a prior history of Lyme.

LE: Is it true that rheumatoid arthritis was originally believed to be caused by an infection?

Dr. Phillips: Retroviruses, parvovirus B19, rubella, Epstein-Barr, and other herpes viruses have all been studied as potential causes of RA.

But the development of the steroid drug cortisone in the late 1940s, which had such an immediate suppressive effect, temporarily covering up painful inflammatory



symptoms, led to a new assumption: that rheumatic disease was autoimmune and tended to run in families.

By the time the side effects and dependency created by the overuse of cortisone became evident and its promise of a "cure" was dispelled, a new medical paradigm and approach to treatment had become firmly established: treat the symptoms, stop looking for a cause, never find a cure.

There have been about a dozen randomized controlled trials comparing antibiotics to placebo, demonstrating benefits from antibiotics but not placebo in RA patients. And some of these studies used antibiotics that were devoid of anti-inflammatory effects.

What's more, studies show benefits from antibiotics in RA patients, over and above the typical drugs prescribed, namely steroids and the chemotherapy drug methotrexate.

LE: How can invading germs flip the "switch" on the body's immune system and cause what are commonly described as autoimmune disorders?

Dr. Phillips: The immune response produced against these infections can also attack normal cells because the invaders are tricky.

They're coated with proteins that look very similar to our own, such as tissue found in our nervous system. When the immune system rallies to attack the bacteria, it can mistakenly attack nerve tissue as well, causing secondary autoimmunity.

LE: Standard, short-term antibiotic treatments are often ineffective. How do you utilize a technique called pulsing to treat Lyme+?

Dr. Phillips: Pulsing means going off and on antibiotics in a predetermined manner, rather than taking them continuously day after day for months on end. For example, a patient would go on an antibiotic protocol for two weeks, then pause for two weeks before repeating it.

Although it may sound counterintuitive and go against what many doctors have been taught about the treatment of bacterial infections—due to the concern of antibiotic resistance—there's robust data published in the journal *Nature* in 2018 that a well-designed pulsed antibiotic regimen can actually reduce the emergence of antibiotic resistance compared to continuous antibiotic therapy.

For Lyme, pulsed antimicrobial therapy can often kill those stubborn persisters more effectively. Laboratory studies in test tubes with *B. burgdorferi* demonstrate that one application of the antibiotic ceftriaxone, for instance, does not eliminate persisters—the intransigent forms of the organism that put the "chronic" in chronic Lyme—but that pulsed therapy with ceftriaxone can.

LE: Are you concerned about the damage that antibiotics can cause to the gut microbiota?

Dr. Phillips: Although I have designed my regimens to focus on fewer antibiotics and more non-antibiotic antimicrobials, antibiotics are usually a necessary component—and all of them can disrupt gut flora to varying degrees.

Not all antibiotics are created equal in this regard. Some are far easier on the gut flora, and these are the ones I use.

I recommend that my patients take an oral probiotic supplement that contains at least 10 billion colony-forming units (CFU) with any antibiotic regimen, taken at least two hours apart from the antibiotics, but with food.

LE: In addition to antibiotics, what else is included in your treatment protocol?

Dr. Phillips: Studies have shown that combinations of antimicrobials against *B. burgdorferi* persisters can be helpful, and it's well known that combinations of effective antibiotics work better than single agents against *Brucella* and *Bartonella*.

The options for a second drug are usually liposomal oil of oregano, monolaurin, fluconazole, or azithromycin.

LE: Can you tell us more about oregano and monolaurin?

Dr. Phillips: Oil of oregano is an herbal antimicrobial that is known to have powerful activity against *B. burgdorferi*, as well as its biofilm, which is a viscous substance formed by colonies of bacteria. The biofilm helps bacteria to survive antibiotics and the assault from the immune system.

Oil of oregano has activity against *Bartonella* in the test tube as well, and I've seen it work many times in *Bartonella* patients.

Monolaurin is a naturally occurring substance in breast milk with broad-range antimicrobial activity against a spectrum of bacteria, including Lyme bacteria, as well as viruses and even parasites. Although no studies of its activity against *Bartonella* have yet been published, I've seen it work in *Bartonella* patients many times.

In my office, we use a preparation that comes in granules; the maximum dose is **3,000 mg** three times daily.

LE: Have other natural solutions been found to be effective?

Dr. Phillips: Herbals that have been shown to be effective in vitro against the Lyme bacteria include grapefruit seed extract, samento, and artemisinin, along with oil of oregano, cinnamon bark oil, clove bud oil, citronella oil, and wintergreen oil.

A 2017 study conducted by researchers from major universities, including Harvard and Johns Hopkins, showed some essential oils killed Lyme bacteria more effectively than antibiotics.

In particular, oils from oregano, garlic cloves, myrrh trees, thyme leaves, cinnamon bark, allspice berries, and cumin seeds were shown to have strong killing activity against the stubborn "persister" forms that most antibiotics can't kill.

Bear in mind that since some of these may be stronger than antibiotics, it would not be advisable to add any into your MD-prescribed protocol on your own. Please, always ask your doctor first.

LE: What action can a ***Life Extension***® reader take if they suspect possible chronic Lyme?

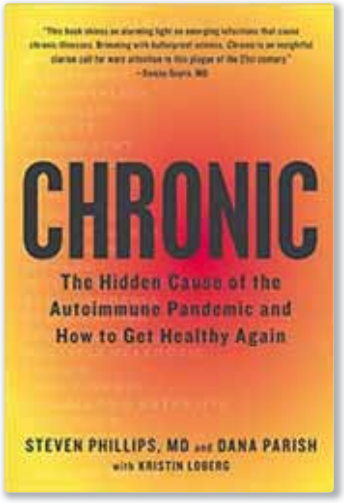
Dr. Phillips: A good first step may be to consult a physician trained by ILADS (International Lyme and Associated Diseases Society). Otherwise, Lyme+ may not be properly evaluated, which can lead to years or decades on the medical merry-go-round.

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

To find a provider, ILADS has a provider search on their website (www.ilads.org).

Steven Phillips, M.D., is a renowned, Yale-trained physician, international lecturer, and media go-to expert. Well-published in the medical literature, he has treated over 20,000 patients with complex, chronic illness from about 20 countries. Phillips experienced firsthand the nightmare of undiagnosed, serious infection after nearly dying from his own "mystery illness," and having to save his own life when 25 doctors could not.

Dana Parish developed Lyme-induced heart failure as a result of being improperly diagnosed by some of the best doctors in the country—and had her life saved by Dr. Phillips. A chart-topping SONY/ATV singer/songwriter who has written songs for artists like Celine Dion and Idina Menzel, she has become a major voice in the world of chronic illness. Her popular column on *Huffington Post* has been read by more than one million people globally.



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* *PLoS Med*. 2005 Sep;2(9):e307;author reply e309.

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Ikaria:
Food and Life in the Blue Zone

BY MENI VALLE

Ikaria is a small Greek island in the Aegean Sea that is considered a **Blue Zone**. These are regions of the world with the longest lifespans and the lowest rates of chronic disease.

Most Blue Zones have one key component in common: a Mediterranean-style diet.

Meni Valle, cookbook author, and an authority on Mediterranean cuisine, traveled to Ikaria to learn the secrets of the Ikarian cuisine.

She shares what she discovered in her latest book, *Ikaria: Food and Life in the Blue Zone*.

As Valle learned, meals on Ikaria are rich in whole grains, nuts, and fish. Olive oil and vegetables are of prime importance, and salads made from fresh, local produce are eaten with every meal.

Just as importantly, meals are eaten among family and friends, highlighting another common denominator among the Blue Zones: social connections.

"Ikaria is a textbook example of the Mediterranean diet in its holistic sense: pure and honest food enjoyed with a community," said Valle. "Most Ikarians grow their own food, giving them nourishment and a deep sense of satisfaction. Eating foods in season, as nature planned, produces mouth-watering, nutritious dishes. I think this is really the way we all want to eat."

Ikaria: Food and Life in the Blue Zone features recipes that Valle learned to cook alongside Ikarian locals.

"These are not complicated recipes requiring hours and hours in the kitchen, but they are lovely, and I've sprinkled them with my own touch," said Valle.

Here, ***Life Extension***® features four recipes that promise to bring the flavor and vitality of Ikaria to your own dinner table.

—LAURIE MATHENA

Tabouleh Salad

45 g (1½ oz / ¼ cup) fine burghul (bulgur wheat)

3 tomatoes, diced

¼ cup sliced spring onions

3 cups parsley, finely chopped

¼ cup mint, finely chopped

1 pomegranate (optional)

1 cucumber, seeded and diced (optional)

60 ml (2 fl oz/¼ cup) olive oil

60 ml (2 fl oz/¼ cup) fresh lemon juice (or white vinegar)

This simple salad is not only healthy but super delicious, and dreamy with a dollop of Greek yogurt.

It is important to chop the vegetables and herbs as finely as you can for this salad. You can use a food processor for the parsley if you like, but make sure to use a sharp knife for the tomatoes and spring onions to keep them in good shape.

In a large bowl soak the burghul with enough hot water to cover and leave for 30 minutes or until all the water is absorbed. Drain any excess water.

Place the tomatoes, spring onions and herbs into a serving bowl and add the burghul. Combine gently with a fork.

If you'd like to add pomegranate to the salad, deseed it by first rolling it on a board to loosen the seeds. Cut in half. Over a bowl, hold one of the halves cut side down and tap the skin with a spoon to release the seeds. It will probably splatter juice, so be gentle and place some paper towel down to catch any juice. Repeat with the second half. Add the pomegranate seeds along with the cucumber, if using, to the salad.

Mix the olive oil and lemon juice together. Drizzle over the salad and stir to combine. Season with salt and pepper. Refrigerate for 1-2 hours and serve chilled.

Taro Root Salad

1 large taro root

1 red onion, sliced (optional)

2 celery stalks, sliced

2 tablespoons chopped parsley

12 pitted black olives

1 tomato, diced

60 ml (2 fl oz/¼ cup) olive oil

60 ml (2 fl oz/¼ cup) lemon juice

Kolokassi, or taro root, is a vegetable that is new to me. It is a root vegetable grown in ample quantities in Ikaria and Cyprus and can be found growing wild near riverbanks and streams. It is one of the main sources of starch in the Ikarian diet, especially in the cooler months. Kolokassi can be cooked in stews in tomato sauce, with beans or in a dip called Skordalia.

It is important to remember that you never wash kolokassi with water or it will become slimy; you scrub or wipe it with paper towel and peel with a sharp knife. Kolokassi is a mucilaginous food, so to prevent it from melting while cooking it is best to break it into large pieces. You do this by inserting a knife into the kolokassi and breaking off pieces, instead of slicing it.

Sweet potatoes or parsnips are good alternatives if you cannot get your hands on kolokassi.

Peel the taro root using a small sharp knife and break into small chunks. Add the taro root to a large saucepan and pour in enough cold water to cover completely.

Bring to the boil over a high heat, then reduce the heat to medium and continue to simmer until the taro root is tender.

Drain well, allow to cool slightly, then transfer to a serving plate. Top with the onion, celery, parsley, olives, and tomato and mix gently to combine. In a small bowl whisk the olive oil and lemon juice, then season to taste with salt and pepper and drizzle over the salad.

Serve at room temperature with grilled meats or fish.

Mushroom Stew

60 ml (2 fl oz/ ¼ cup) olive oil

1 red onion, diced

1 garlic clove, crushed

600 g (1 lb 5 oz) mushrooms, thickly sliced or left whole if small

100 ml (3½ fl oz) red wine

3 ripe tomatoes, grated

2 tablespoons red-wine vinegar

1 bay leaf

1 tablespoon finely chopped oregano (use half quantity if using dried)

1 tablespoon finely chopped thyme (use half quantity if using dried)

¼ teaspoon ground nutmeg

pinch of ground cumin

150 g (5 ½ oz) baby green peas

Autumn and early winter, from October to December, create the perfect conditions for wild mushrooms to grow in Ikaria. The locals hope for rain followed by some sunshine, as this is the environment in which the mushrooms flourish.

Each variety of mushroom grows in its own terrain, either high in the mountains or close to the sea. This influences their taste, color and shape. Ikarians know where to hunt for them and also know which not to pick as some are poisonous.

There are dozens of varieties that are used in stews and pies.

This dish is particularly appetizing served with some homemade macaroni or Makaronia.

Heat the oil in a large saucepan over a medium heat. Add the onion and sauté until soft.

Add the garlic and combine well with the onions. Add the mushrooms and gently combine with the onion and garlic mixture.

Cook for 2–3 minutes.

Pour in the wine and bring to the boil. Reduce the heat to a simmer and add the grated tomatoes, red-wine vinegar, herbs and spices.

Season to taste with salt and pepper and simmer gently for about 15–20 minutes, add the green peas and continue cooking for a further 10 minutes until the mushrooms are tender.

Serve with fresh bread, as a side or as a sauce over pasta.

Split Pea Dip with Caramelized Onions

450 g (1 lb) yellow split peas

1 brown onion, peeled and diced

1 garlic clove, crushed

juice of ½ lemon

20 ml (¾ fl oz) olive oil

paprika (optional)

CARAMELIZED ONIONS

60 ml (2 fl oz/ ¼ cup) olive oil

2 large red onions, thinly sliced

The caramelized onions go well with the fava, adding a subtle sweetness. It's typically served with capers, but you can also use some pickled samphire or Kritamo, which is also lovely.

Rinse the peas under cold water, discarding any discolored ones. Place the peas and onion in a large saucepan and pour in enough water to cover completely. Place on the stovetop on a medium–high heat and bring to the boil.

Lower the heat and simmer for 30 minutes or until the split peas are cooked through and the mixture is thick and chunky. Strain out any excess water.

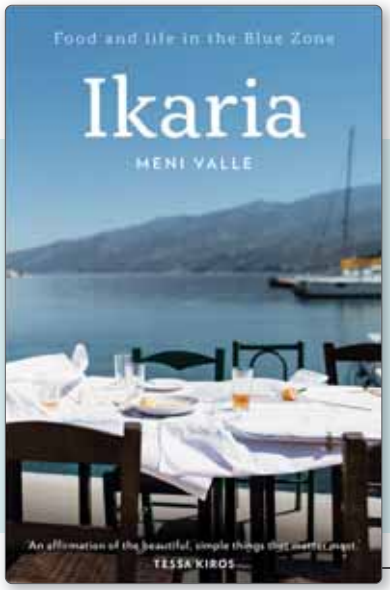
Add the garlic, lemon juice and olive oil and mix well until all blended. The mixture should remain fairly chunky. Season with salt and pepper, and garnish with paprika, if using.

To make the caramelized onions, warm the olive oil on a medium heat in a deep frying pan and add the onions, coating the onions well in the oil.

Reduce the heat to low and continue stirring while cooking.

Slow-cooking the onions will produce a rich color, and the natural sugars in the onions aid in the caramelization. Season with some salt.

Serve the dip topped with the caramelized onions alongside crusty bread, olives and cheese.



Recipes excerpted with permission from *Ikaria* by Meni Valle, published by Hardie Grant Books September 2020. Photo credit: Lean Timms

To order a copy of *Ikaria: Food and Life in the Blue Zone*, call 1-800-544-4440 or visit **www.LifeExtension.com**

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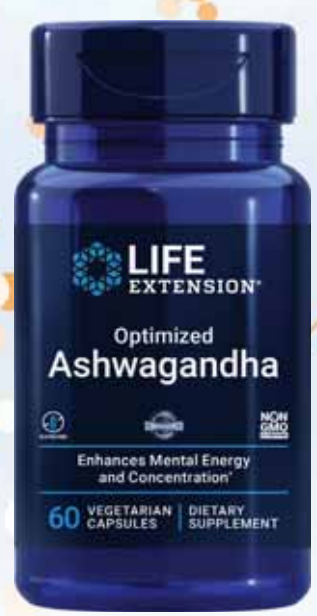

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OATS

BY LAURIE MATHENA

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It turns out one of the simplest breakfast foods is also one of the ***healthiest***.

Oats, as part of your regular diet, can help improve markers of heart health, improve glycemic response, and support modest weight loss.

Their heart-healthy benefits are so well documented that the FDA has allowed foods containing oat bran or rolled oats to carry a label claiming they *may reduce the risk of heart disease, when combined with a low-fat diet*.

But oats carry benefits beyond heart health.

They are a nutritionally well-balanced food that contains high amounts of fiber, and more protein and healthy unsaturated fat than many other whole grain foods.[1]

Oats contain **beta glucans**. Unlike beta glucans found in other foods which have different health benefits, oat beta glucans have been found to help lower cholesterol levels, help control blood glucose levels, reduce high blood pressure, and alleviate ischemic heart injury.[2]

Adding oat beta glucans to the diet has been shown to help reduce LDL and total cholesterol.[3]

And a study of type II diabetics found that consuming oat bran flour high in beta glucan lowered the glycemic response and decreased the after-meal glycemic response.[4]

The beta glucan found in oatmeal can prolong the time it takes your stomach to empty food, which can help you feel fuller, longer.[5] In addition, eating beta glucans promotes the release of a satiety hormone that can help regulate appetite.[6]

In addition to beneficial plant compounds called polyphenols, oats contain a unique group of antioxidants called **avenanthramides**.

Avenanthramides can enhance **nitric oxide** production and inhibit smooth muscle cell proliferation—actions that could help prevent atherosclerosis by dilating blood vessels and improving blood flow.[7]

For added taste and nutrients, top a bowl of oatmeal with cinnamon, chopped nuts, sliced fruit, or chia seeds.

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01921 Uric Acid Control
01209 Water-Soluble Pumpkin Seed Extract

LIVER HEALTH & DETOXIFICATION

01922 Advanced Milk Thistle • 60 softgels
01925 Advanced Milk Thistle • 120 softgels
02240 Anti-Alcohol Complex
01651 Calcium D-Glucarate
00550 Chlorella
01571 Chlorophyllin
01522 Milk Thistle • 60 veg capsules
02402 FLORASSIST® Liver Restore™
01541 Glutathione, Cysteine & C
01393 HepatoPro
01608 Liver Efficiency Formula
01534 N-Acetyl-L-Cysteine
00342 PectaSol-C® Modified Citrus Pectin Powder
01080 PectaSol-C® Modified Citrus Pectin Capsules
01884 Silymarin
02361 SOD Booster

PRODUCTS

LONGEVITY & WELLNESS

00457 Alpha-Lipoic Acid
01625 AppleWise
02414 Bio-Fisetin
01214 Blueberry Extract
01438 Blueberry Extract and Pomegranate
02270 DNA Protection Formula
02405 Endocannabinoid System Booster
02119 GEROPROTECT® Ageless Cell™
02415 GEROPROTECT® Autophagy Renew
02133 GEROPROTECT® Longevity A.I.™
02401 GEROPROTECT® Stem Cell
02211 Grapeseed Extract
00954 Mega Green Tea Extract (decaffeinated)
00953 Mega Green Tea Extract (lightly caffeinated)
01513 Optimized Fucoidan with Maritech® 926
02230 Optimized Resveratrol
01637 Pycnogenol® French Maritime Pine Bark Extract
02210 Resveratrol
00070 RNA (Ribonucleic Acid)
02301 Senolytic Activator®
01208 Super R-Lipoic Acid
01919 X-R Shield

MEN'S HEALTH

02209 Male Vascular Sexual Support
00455 Mega Lycopene Extract
02306 Men's Bladder Control
01789 PalmettoGuard® Saw Palmetto and Beta-Sitosterol
01790 PalmettoGuard® Saw Palmetto/Nettle Root Formula and Beta-Sitosterol
01837 Pomi-T®
01373 Prelox® Enhanced Sex for Men
01940 Super MiraForte with Standardized Lignans
01909 Triple Strength ProstaPollen™
02029 Ultra Prostate Formula

MINERALS

01661 Boron
02107 Extend-Release Magnesium
30731 Ionic Selenium
01677 Iron Protein Plus
02403 Lithium
01459 Magnesium Caps
01682 Magnesium (Citrate)
01328 Only Trace Minerals
01504 Optimized Chromium with Crominex® 3+
02309 Potassium with Extend-Release Magnesium
01740 Sea-Iodine™
01879 Se-Methyl L-Selenocysteine
01778 Super Selenium Complex
00213 Vanadyl Sulfate
01813 Zinc Caps

MISCELLANEOUS

00577 Potassium Iodide
00657 Solarshield® Sunglasses

MOOD & STRESS MANAGEMENT

02312 Cortisol-Stress Balance
00987 Enhanced Stress Relief
01074 5 HTP
01683 L-Theanine
02175 SAMe (S-Adenosyl-Methionine) 200 mg, 30 enteric coated vegetarian tablets
02176 SAMe (S-Adenosyl-Methionine) 400 mg, 30 enteric coated vegetarian tablets
02174 SAMe (S-Adenosyl-Methionine) 400 mg, 60 enteric coated vegetarian tablets

MULTIVITAMINS

02199 Children's Formula Life Extension Mix™
02498 Comprehensive Nutrient Packs ADVANCED
02354 Life Extension Mix™ Capsules
02364 Life Extension Mix™ Capsules without Copper
02356 Life Extension Mix™ Powder
02355 Life Extension Mix™ Tablets
02357 Life Extension Mix™ Tablets with Extra Niacin
02365 Life Extension Mix™ Tablets without Copper
02292 Once-Daily Health Booster • 30 softgels
02291 Once-Daily Health Booster • 60 softgels
02313 One-Per-Day Tablets
02317 Two-Per-Day Capsules • 60 capsules
02314 Two-Per-Day Capsules • 120 capsules
02316 Two-Per-Day Tablets • 60 tablets
02315 Two-Per-Day Tablets • 120 tablets

NERVE & COMFORT SUPPORT

02202 ComfortMAX™
02303 PEA Discomfort Relief

PERSONAL CARE

01006 Biosil™ • 5 mg, 30 veg capsules
01007 Biosil™ • 1 fl oz
00321 Dr. Proctor's Advanced Hair Formula
00320 Dr. Proctor's Shampoo
02322 Hair, Skin & Nails Collagen Plus Formula
01278 Life Extension Toothpaste
00408 Venotone
00409 Xyliwhite Mouthwash
02304 Youthful Collagen
02252 Youthful Legs

PET CARE

01932 Cat Mix
01931 Dog Mix

PROBIOTICS

01622 Bifido GI Balance
01825 FLORASSIST® Balance
02421 FLORASSIST® Daily Bowel Regularity
02125 FLORASSIST® GI with Phage Technology
01821 FLORASSIST® Heart Health
02250 FLORASSIST® Mood Improve
02208 FLORASSIST® Immune & Nasal Defense
02120 FLORASSIST® Oral Hygiene
02203 FLORASSIST® Prebiotic
01920 FLORASSIST® Throat Health
02400 FLORASSIST® Winter Immune Support
52142 Jarro-Dophilus® for Women
00056 Jarro-Dophilus EPS® • 60 veg capsules
21201 Jarro-Dophilus EPS® • 120 veg capsules
01038 Theralac® Probiotics
01389 TruFlora® Probiotics

SKIN CARE

80157 Advanced Anti-Glycation Peptide Serum
80165 Advanced Growth Factor Serum
80170 Advanced Hyaluronic Acid Serum
80154 Advanced Lightening Cream
80155 Advanced Peptide Hand Therapy
80175 Advanced Probiotic-Fermented Eye Serum
80177 Advanced Retinol Serum
80152 Advanced Triple Peptide Serum
80140 Advanced Under Eye Serum with Stem Cells
80137 All-Purpose Soothing Relief Cream
80139 Amber Self MicroDermAbrasion
80118 Anti-Aging Mask
80151 Anti-Aging Rejuvenating Face Cream
80153 Anti-Aging Rejuvenating Scalp Serum

80179 Brightening Peptide Serum
80176 Collagen Boosting Peptide Cream
80156 Collagen Boosting Peptide Serum
02408 Collagen Peptides for Skin & Joints
80180 CoQ10 and Stem Cell Rejuvenation Cream
80169 Cucumber Hydra Peptide Eye Cream
02423 Daily Skin Defense
80141 DNA Support Cream
80163 Eye Lift Cream
80123 Face Rejuvenating Anti-Oxidant Cream
80109 Hyaluronic Facial Moisturizer
80110 Hyaluronic Oil-Free Facial Moisturizer
80138 Hydrating Anti-Oxidant Facial Mist
00661 Hydroderm
55495 Instensive Moisturizing Cream
80103 Lifting & Tightening Complex
80168 Melatonin Advanced Peptide Cream
80114 Mild Facial Cleanser
80172 Multi Stem Cell Hydration Cream
80159 Multi Stem Cell Skin Tightening Complex
80122 Neck Rejuvenating Anti-Oxidant Cream
80174 Purifying Facial Mask
80150 Renewing Eye Cream
80142 Resveratrol Anti-Oxidant Serum
01938 Shade Factor™
02129 Skin Care Collection Anti-Aging Serum
02130 Skin Care Collection Day Cream
02131 Skin Care Collection Night Cream
80166 Skin Firming Complex
02096 Skin Restoring Ceramides
80130 Skin Stem Cell Serum
80164 Skin Tone Equalizer
80143 Stem Cell Cream with Alpine Rose
80148 Tightening & Firming Neck Cream
80161 Triple-Action Vitamin C Cream
80162 Ultimate MicroDermabrasion
80173 Ultimate Peptide Serum
80178 Ultimate Telomere Cream
80160 Ultra Eyelash Booster
80101 Ultra Wrinkle Relaxer
80113 Under Eye Refining Serum
80104 Under Eye Rescue Cream
80171 Vitamin C Lip Rejuvenator
80129 Vitamin C Serum
80136 Vitamin D Lotion
80102 Vitamin K Cream

SLEEP

01512 Bioactive Milk Peptides
02300 Circadian Sleep
01551 Enhanced Sleep with Melatonin
01511 Enhanced Sleep without Melatonin
02234 Fast-Acting Liquid Melatonin
01669 Glycine
02308 Herbal Sleep PM
01722 L-Tryptophan
01668 Melatonin • 300 mcg, 100 veg capsules
01083 Melatonin • 500 mcg, 200 veg capsules
00329 Melatonin • 1 mg, 60 capsules
00330 Melatonin • 3 mg, 60 veg capsules
00331 Melatonin • 10 mg, 60 veg capsules
00332 Melatonin • 3 mg, 60 veg lozenges
02201 Melatonin IR/XR
01787 Melatonin 6 Hour Timed Release 300 mcg, 100 veg tablets
01788 Melatonin 6 Hour Timed Release 750 mcg, 60 veg tablets
01786 Melatonin 6 Hour Timed Release 3 mg, 60 veg tablets
01721 Optimized Tryptophan Plus
01444 Quiet Sleep
01445 Quiet Sleep Melatonin

VITAMINS

01533 Ascorbyl Palmitate
00920 Benfotiamine with Thiamine
00664 Beta-Carotene
01945 BioActive Complete B-Complex
00102 Biotin
00084 Buffered Vitamin C Powder
02229 Fast-C® and Bio-Quercetin Phytosome
02075 Gamma E Mixed Tocopherol Enhanced with Sesame Lignans
02070 Gamma E Mixed Tocopherol & Tocotrienols
01913 High Potency Optimized Folate
01674 Inositol Caps
02244 Liquid Vitamin D3 • 50 mcg (2000 IU)
02232 Liquid Vitamin D3 (Mint) • 50 mcg (2000 IU)
01936 Low-Dose Vitamin K2
00065 MK-7
00373 No Flush Niacin
01939 Optimized Folate (L-Methylfolate)
01217 Pyridoxal 5'-Phosphate Caps
01400 Super Absorbable Tocotrienols
02334 Super K
02335 Super K Elite
01863 Super Vitamin E
02028 Vitamin B5 (Pantothenic Acid)
01535 Vitamin B6
00361 Vitamin B12 Methylcobalamin
01536 Vitamin B12 Methylcobalamin • 1 mg, 60 veg lozenges
01537 Vitamin B12 Methylcobalamin • 5 mg, 60 veg lozenges
02228 Vitamin C and Bio-Quercetin Phytosome 1,000 mg, 60 veg tablets
02227 Vitamin C and Bio-Quercetin Phytosome 1,000 mg, 250 veg tablets
01753 Vitamin D3 • 25 mcg (1000 IU), 90 softgels
01751 Vitamin D3 • 25 mcg (1000 IU), 250 softgels
01713 Vitamin D3 • 125 mcg (5000 IU), 60 softgels
01718 Vitamin D3 • 175 mcg (7000 IU), 60 softgels
01758 Vitamin D3 with Sea-Iodine™
02040 Vitamins D and K with Sea-Iodine™

WEIGHT MANAGEMENT & BODY COMPOSITION

00658 7-Keto® DHEA Metabolite • 25 mg, 100 capsules
02479 7-Keto® DHEA Metabolite • 100 mg, 60 veg capsules
01509 Advanced Anti-Adipocyte Formula
01807 Advanced Appetite Suppress
02207 AMPK Metabolic Activator
01492 Calorie Control Complex with Phase 3™ and African Mango
02478 DHEA Complete
01738 Garcinia HCA
01292 Integra-Lean®
01908 Mediterranean Trim with Sinetrol™ -XPur
01432 Optimized Saffron
00818 Super CLA Blend with Sesame Lignans
01902 Waist-Line Control™
02151 Wellness Code® Appetite Control

WOMEN'S HEALTH

01942 Breast Health Formula
01626 Enhanced Sex for Women 50+
01894 Estrogen for Women
01064 Femmenessence MacaPause®
02204 Menopause 731™
02319 Prenatal Advantage
01441 Progesta-Care®
01649 Super-Absorbable Soy Isoflavones

HIGHLY ABSORBABLE

Astaxanthin

Supports Heart Health

Astaxanthin is a carotenoid that benefits the brain, heart, skin, and immune system. Research suggests that astaxanthin can play a role in promoting cardiovascular health.[1]

Found naturally in seafood and algae, as little as **50%** of **astaxanthin** is normally ***absorbed*** in the blood-stream.[2,3]

Life Extension® combines **4 mg** of **astaxanthin** with a blend of four different **phospholipids**, which has been shown to enhance carotenoid ***absorption*** by **several-fold**.[4]

References

1. *Nutrients*. 2020 Jun; 12(6): 1896.
2. *Mol Nutr Food Res*. 2012 Sep;56(9):1385-97.
3. *Eur J Pharm Sci*. 2003 Jul;19(4):299-304.
4. *Int J Pharm*. 2011 June 30; 412(1-2):99-105.

Item #01923 • 30 softgels

1 bottle **$12**

4 bottles $10.50 each

GLUTEN FREE

NON GMO LE CERTIFIED

For full product description and to order **Astaxanthin 4 mg with Phospholipids**, call 1-800-544-4440 or visit www.LifeExtension.com

More Nutrients *Higher* Potencies

LIFE EXTENSION® TWO-PER-DAY

Compared to Centrum® Two-Per-Day Provides:

- 50 times the VITAMIN B1
- 25 times the VITAMIN B6
- 12 times the VITAMIN B12
- 10 times the BIOTIN
- 10 times the SELENIUM
- 8 times the VITAMIN C
- 2.5 times the VITAMIN B3
- 2 times the VITAMIN D
- 3 times the VITAMIN E
- 2 times the ZINC

Two-Per-Day Multivitamin Capsules

Item **#02314** • 120 capsules (two-month supply)
1 bottle $18 • 4 bottles $16 each

Two-Per-Day Multivitamin Tablets

Item **#02315** • 120 tablets (two-month supply)
1 bottle $17.25 • 4 bottles $15.50 each

Each bottle provides a two-month supply.

For full product description and to order **Two-Per-Day Multivitamin**, call **1-800-544-4440** or visit **www.Life Extension.com**

GLUTEN FREE

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