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References

1. *Journal of Functional Foods*. 2011;3(3):171-8.
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3. *Nutrients*. 2014 Oct 30;6(11):4805-21.

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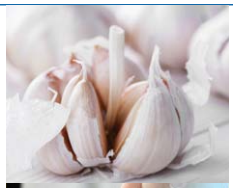

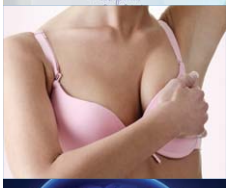

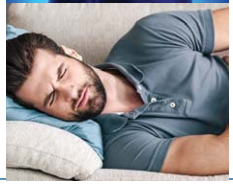

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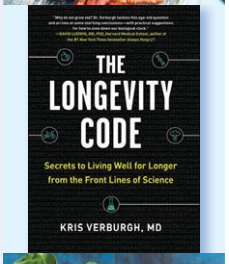
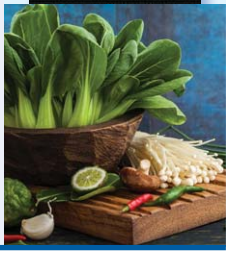
Some women choose not to take even bioidentical **estrogen** drugs. An extract from **Siberian rhubarb** has been shown in **human** studies to relieve menopausal symptoms up to **83%**. These benefits include improvements in mood such as anxiety and depression.

DEPARTMENTS





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October 2018

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Scientific Advisory Board

Örn Adalsteinsson, PhD, is chairman of the **Life Extension**® Scientific Advisory board. He holds a master's and doctorate from the Massachusetts Institute of Technology (MIT). He has specialized in human therapeutics including vaccines, monoclonal antibodies, product development, nutraceuticals, formulations, artificial intelligence, hormones, and nutritional supplementation. He has also authored articles and contributed to peer-reviewed publications and served as an editor for the *Journal of Medicinal Food*.

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 obtained 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 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.

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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 new University of Central Florida Medical School.

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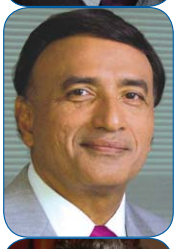

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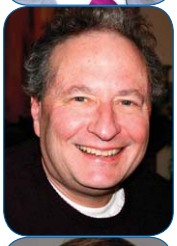
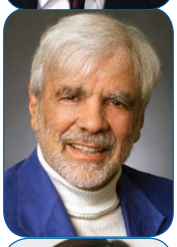
Dr. Dipnarine Maharaj is the Medical Director of the South Florida Bone Marrow Stem Cell Transplant Institute and is regarded as one of the world's foremost experts on adult stem cells. He received his medical degree in 1978 from the University of Glasgow Medical School, Scotland. He completed his internship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



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 over 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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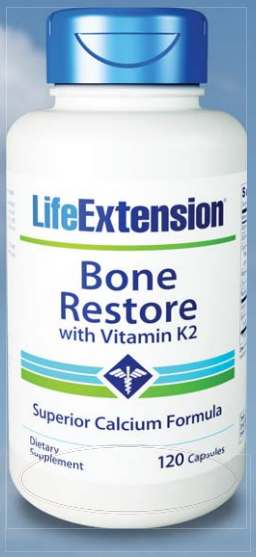

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BY WILLIAM FALOON

Stop the *Breast Cancer* Epidemic

Breast cancer is the most prevalent malignancy in women. Healthy lifestyle choices can substantially reduce risk.

Menopausal women, however, continue to use **hormone drugs** that were long ago shown to increase **breast cancer** risk.

Premarin® is a drug that contains estrogens unnatural to the human body.

While Premarin® alone does not appear to increase the risk of breast cancer,[1] the **FDA** obstructs women's access to what we believe are safer forms of natural estrogens, like **estriol**.

The hormone drugs that concern us most are **synthetic progestogens** that continue to be prescribed, despite evidence that they can increase **breast cancer** risk.[2-4]

Back in the early **1990s**, we published findings from studies showing that **natural progesterone** provided benefits to menopausal and postmenopausal woman (including reduced breast cancer risk) in contrast to a **synthetic progestogen** (medroxyprogesterone acetate).[5,6]

Our recommendation was bolstered in **2002** and **2004** with publications from the **Women's Health Initiative** showing ***higher*** breast cancer incidence in women prescribed **synthetic progestogens** (with or without Premarin®).[1,2]

Our concerns about the risks posed by FDA-approved hormone drugs have remained largely consistent for the past 25 years.

Life Extension® advocates for the use of **bioidentical hormones** as opposed to horse urine-derived estrogens and synthetic progestogens.

On page 28 of this month's issue, we describe an alternative for those women who choose not to replace hormones lost to menopause.

This editorial describes what women can do to reduce their **breast cancer** risk.

The Estrogen Dilemma

As women enter their **menopausal** years they face a difficult decision.

Their bodies' production of **estrogen**, **progesterone** and other youth-promoting hormones, like **DHEA**, rapidly declines.

While individual effects of **menopause** vary, most women suffer because their glands no longer produce the **hormones** needed to regulate critical physiological processes.

Depression, irritability, and short-term memory lapses are common menopausal complaints, along with hot flashes, night sweats, and insomnia.

Synthetic hormone drugs that were once widely prescribed have been shown to produce deadly **side effects**, yet they remain on the market courtesy of the **FDA**.

More women now seek natural hormone replacement strategies to find relief from menopausal symptoms.

Rather than repeat what we've written since the early **1990s** about safer ways to replace female hormones, we performed an analysis of recent published data.

These latest findings help corroborate what we wrote **25 years ago**.

It is now crystal clear that women can better balance risk with benefit by using **bioidentical hormones** or **plant extracts** that have menopausal relief properties.

Evidence From 2002-2017

A scientist frustrated with the lack of consensus about **menopausal hormone therapy** wrote a review article in **2017** that sought to pull together research that began with the famous **Women's Health Initiative** trial in **2002**.[7]

The **Women's Health Initiative** trial was designed to test whether the beneficial associations seen in women starting hormone replacement near menopause would be found in women beyond menopause.

The trial was terminated early because most findings turned out **opposite** of what conventional doctors expected.

The **2002** report revealed *higher* **breast cancer** risk and no cardiovascular benefit in women prescribed the combination of **horse urine-derived estrogen** with a **synthetic progestogen** used in a commonly prescribed drug called **Prempro®**.[2]

Two years later, however, another arm of the **Women's Health Initiative** trial suggested that horse urine estrogens used alone prevented **coronary heart disease** in women who began hormone therapy under age 60, along with a reduction in breast cancer overall.[1,7]

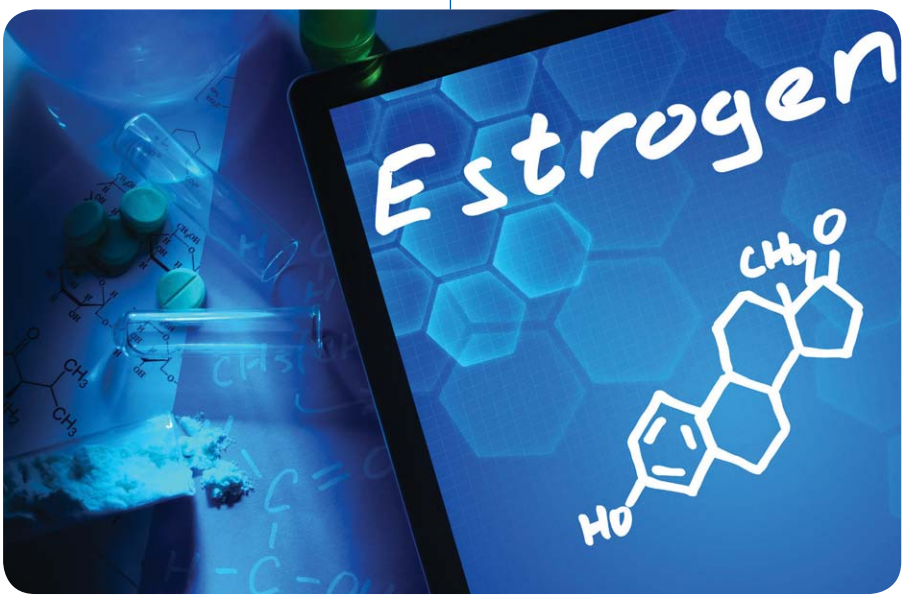
The author of this **2017** review expressed frustration that beneficial findings from this arm of the **Women's Health Initiative** trial have been overlooked.[7]

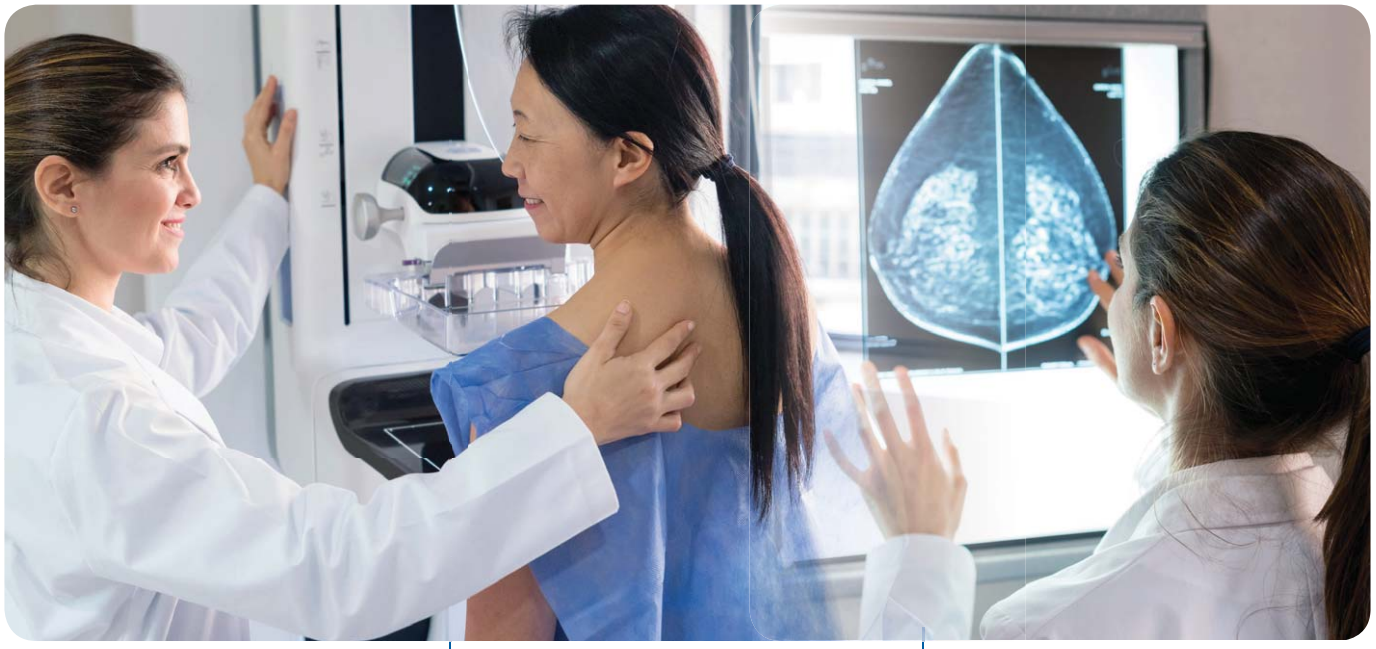
Estrogen therapy has been available for more than 60 years for menopausal symptoms such as painful intercourse, cognitive impairment, reduced tissue atrophy, and bone density loss.[1] The author of the **2017 review article** sought to wrap this up by concluding:

"Critically, the 'facts' that most women and clinicians consider in making the decision to use, or not use, HRT (hormone replacement therapy) are frequently wrong or incorrectly applied."[7]

We at **Life Extension** largely concur that fears of **breast cancer** from the **2002** report from **the Women's Health Initiative** trial frightened many menopausal women away from hormone replacement therapy, including **bioidentical estrogens** and **natural progesterone** (not synthetic progestogen).

The villain in the **2002** report, based on our review of the published literature, was the **synthetic progestogen** (medroxyprogesterone acetate) that is used in **Provera®** and **Prempro®** drugs.





Specific Synthetic Progestogens Implicated

An analysis of 14 prior studies looked at women who used only **estradiol** (a natural estrogen) and compared them with women prescribed **estradiol** + different **progestogens** or **natural progesterone**.[8]

This study found no increased **breast cancer** risk in **estradiol-only** or **estradiol** + **natural-progesterone** groups.[8]

There were huge differences, however, based on the type of **synthetic progestogen** drug and how long it was used.

Women prescribed some of the most popular **synthetic progestogen** drugs (medroxyprogesterone, norethisterone and levonorgestrel) for less than five years had **1.39-fold** increased odds of breast cancer.[8]

Women who used these **synthetic progestogens** for more than five years had **2.25-fold** increased odds of breast cancer.[8]

Medroxyprogesterone is the **synthetic progestogen** used in **Provera®** and **Prempro®** (combination of **horse-urine estrogens** and **progestogens**).

Provera® and **Prempro®** have been leading drugs prescribed **long-term** to women in all phases of **menopause**. As it related to use of **synthetic progestogen** drugs, the authors of this analysis concluded:

"The breast cancer risk rises progressively by prolonged use, furthermore, comparing to sequential therapy, continuous therapy carries a higher risk."[8]

Mammogram Density Change with Estrogen-Progestin Drugs

In women with dense breast tissue, it's more difficult to detect tumors using **mammograms**.

Researchers sought to ascertain if **estrogen** + **synthetic progestogen** drug therapy increases mammographic density and breast cancer incidence.

This case-control study looked at postmenopausal women randomly assigned to daily **conjugated equine** (horse-urine) **estrogen** 0.625 mg + **synthetic progestogen** (medroxyprogesterone acetate 2.5 mg) or **placebo**.[9]

Among women in the **estrogen + synthetic progestogen** arm, each **1%** positive change in mammographic **density** increased **breast cancer** risk **3%**.

For women in the ***highest*** quintile of mammographic **density change** (>**19.3%** increase), **breast cancer** risk increased a startling **3.6-fold**.[9]

What was discovered in this study, however, is that the **estrogen + synthetic-progestogen** drugs ***only*** increased **breast cancer** in women who also showed increased mammographic **density**.[9]

The authors concluded by stating:

"All of the increased risk from estrogen plus progestin use was mediated through mammographic density change."[9]

These findings suggest that women using hormone replacement drugs should make sure they are not increasing mammographic density.

This study adds to a growing body of published evidence for women to avoid **synthetic progestogens** (and if for no other reason than common sense, to avoid **horse urine-derived** estrogens when natural-to-the-human-body estrogens are available).

Menopausal Hormone Therapy and Reproductive Cancer Risk

A nationwide Swedish population-based study was done on more than 290,000 women (age 40 and over) that compared those who had used **menopausal hormone therapy** with those who had not.

The results, published in **2017**, found a **31%** higher incidence of **breast**, **endometrial** or **ovarian cancer** in women who used any **menopausal hormone therapy** compared to the general Swedish population.[15]

The greatest incidence of these cancers occurred in women who had used an **estrogen** + **synthetic progestogen**, which corresponds with previous studies showing **synthetic progestogens**, and not estrogen itself, is the culprit.

This large study also found that women using **estrogen** have lower rates of **gastrointestinal cancers**. This Swedish study concluded:

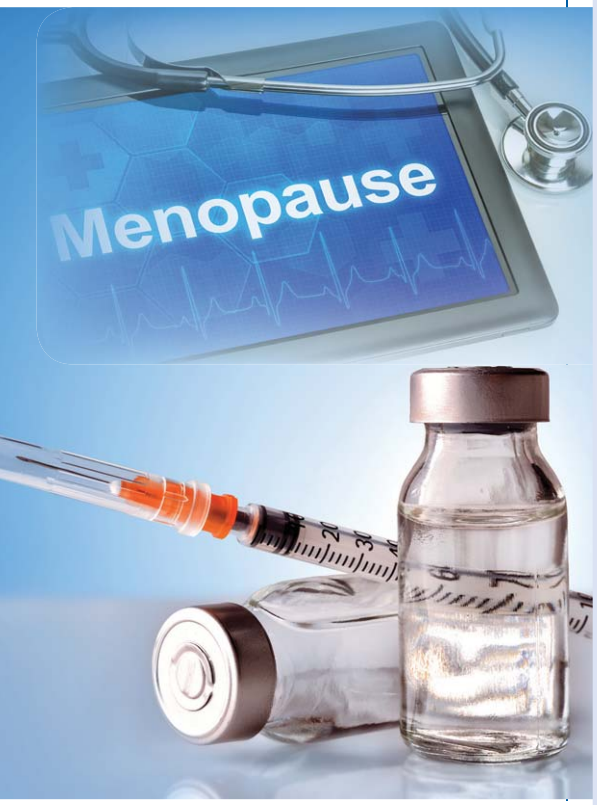
"MHT [menopausal hormone therapy], notably EP-MHT [estrogen-synthetic progestogen], was associated with a limited increase in overall cancer risk. The increased risk of female reproductive organ cancers was almost balanced by a decreased risk of gastrointestinal cancers."[15]

As you will read later, studies published in **2017** are showing **estrogen** by itself has interesting protective mechanisms against digestive tract cancers.

Obesity-Associated Breast Cancer

There is a strong association between increased **body mass index** (BMI) and higher **breast cancer** incidence in postmenopausal women. Also, obese women are at higher risk of all-cause and breast cancer-specific mortality when compared to non-obese women with breast cancer.[17]

Some factors that obese women have to contend with are very high levels of **estrogens** due to excessive aromatization activity in fat tissues.[17]



Hormone Drugs Increase Certain Breast Cancer Types

Breast cancer is a generic term that describes a wide range of malignancies that originate in breast tissues.

Some descriptive terms you may have heard relating to type of breast cancer cells are "***estrogen receptor positive***," "***HER2-positive***," or "***triple negative***."

Triple negative means there is no receptor for estrogen, progesterone, or human epidermal growth factor (HER2), which makes "triple negative" breast cancers very difficult to treat.

An analysis published in **2017** reviewed a number of breast cancer risk factors. The findings showed that, compared to those who never took the treatment, women prescribed conventional **estrogen** + **synthetic progestogen** drugs had a striking **2.92-fold** increase in **luminal A** breast tumors.[10] Anywhere between **30%-70%** of all breast cancers are this subtype.[11-14]

Interestingly, use of these same hormone drugs resulted in a **12%** lower rate of **HER2-positive** and **8%** lower rate of **triple negative** breast cancer subtypes.

As it relates to **estrogen-progestogen** drug use, the authors of the study concluded:

"Hormone therapy use was strongly associated with risk of luminal-like breast cancer, and less so with risk of HER2-positive or triple-negative cancer."[10]

The findings from this study showing slightly lower risk of more difficult-to-treat breast cancers appear to be outweighed by the almost **3-fold** increase in more common breast cancer types.

Evaluating Long-Term Menopause Hormone Therapy

A review released in January **2017** sought to tie together a large number of previous studies that looked at conventional hormone therapies.[16]

The review included 22 studies involving 43,637 women. Nearly **70%** of the data came from two well-conducted studies published in **1998**. This meant the majority of women were likely prescribed **horse urine-derived estrogens** with a **synthetic progestogen**.

Most participants were postmenopausal American women over 60 years of age with some pre-existing chronic disorders.

Some of the adverse findings from this pooled group of women who mostly used continuous **estrogen** + **synthetic-progestogen** drugs were:[16]

- Increased risk of a coronary event (after one year's use) from **two** per 1,000 to between **three** and **seven** per 1,000;
- Venous thromboembolism (after one year's use) from **two** per 1,000 to between **four** and **11** per 1,000);
- Stroke (after three years' use) from **six** per 1,000 to between **six** and **12** per 1,000;
- Breast cancer (after 5.6 years' use) from **19** per 1,000 to between **20** and **30** per 1,000);
- Gallbladder disease (after 5.6 years' use) from **27** per 1,000 to between **38** and **60** per 1,000)
- Death from lung cancer after 5.6 years' use (plus 2.4 years' additional follow-up) from **five** per 1,000 to between **six** and **13** per 1,000).
- Estrogen-only hormone therapy increased the risk of venous thromboembolism (after one to two years' use) from **two** per 1,000 to **two** to **10** per 1,000; after **seven** years' use, from **16** per 1,000 to **16** to **28** per 1,000;
- Stroke (after seven years' use) from **24** per 1,000 to between **25** and **40** per 1,000).

None of these adverse findings are surprising in light of what we now know about the significant side effects associated with the **synthetic progestogen** (medroxyprogesterone) used by most of these women and the pro-thrombotic (clotting) impact of high-dose estrogen.

Synthetic hormone drugs are not the only risk factors for breast cancer, as you are reading in this editorial.

In obese postmenopausal women with **estrogen-receptor positive** tumors, estrogen replacement therapy should be discontinued[18] and the aromatase-inhibitor drug **letrozole** should be initiated.[19,20]

Other factors that fuel **breast tumors** in overweight women are:[17]

- Overexpression of inflammatory cytokines
- Insulin resistance
- Activation of insulin-like growth factor (IGF) pathways
- Fat cell-derived adipokines
- High cholesterol
- Excess oxidative stress

Increased blood levels of **glucose**,[21] **insulin**,[22] **IGF**,[23] **cholesterol**,[24] and **inflammatory** factors[25] leads to accelerated tumor formation and exacerbates their aggressiveness.

These cancer cell proliferation factors suggest to us that breast cancer patients (and overweight women) should neutralize them via:

- Anti-inflammatory drugs (aspirin) and nutrient extracts (curcumin and green tea)[26-28]
- AMPK activating drugs (metformin)[29] and natural products (*Gynostemma pentaphyllum* and hesperidin)[30]
- mTOR suppressing nutrients such as Withaferin A[31,32]
- Reduce intake of dietary sugars and starches[33-35]
- Initiate cholesterol-lowering diet and/or drugs[36-38]
- Increase intake of antioxidants[39-41]

In postmenopausal women who are <u>not</u> taking exogenous hormones, general **obesity** is a significant predictor for breast cancer.[17,42]

Women can reduce this breast cancer risk by avoiding being overweight and avoiding high-glycemic/high fat foods.[17,43]

Women using **estrogen** and **synthetic progestogen** hormone therapy for more than five years have elevated risks of both invasive ductal and lobular breast cancer.[17] These cases have higher cancer-related mortality.

Estrogen Reduces Liver Cancer Incidence

Primary **liver cancer** is medically termed **hepatocellular carcinoma**. The prognosis is often grim for those diagnosed with these kinds of malignancies.

A case-control study evaluated 234 female patients treated for primary liver cancer. Researchers compared them with 282 healthy women (control subjects) over an 11-year period.[59]

After adjusting for other risk factors, the women who had ever used **estrogen** had a reduced incidence of contracting primary liver cancer.

Long-term estrogen users had a five-year age delay in contracting liver cancer (**64.5** years at diagnosis in estrogen users compared to **59.2** years in non-estrogen users).

Estrogen use reduced risk of death from **liver cancer** by **45%** and increased overall survival times amongst patients over nine months.[59]

This study published in **2017** correlates with previous findings showing reductions in gastrointestinal malignancies in response to menopausal estrogen therapy.[60,61]

Hormone Drugs Reduce Digestive Cancer Risks

While reproductive cancers (breast, endometrium, ovaries) have been found to increase in women taking **estrogen** + **synthetic progestogen** drugs, the effects of these medications on liver and digestive tract cancer risk appears to move in the opposite direction.

Another analysis published in **2017** found that women taking menopausal hormone therapy (estrogen alone or estrogen + synthetic progestogen) compared to nonusers have a:[62]

- **38%** reduction in esophageal adenocarcinoma
- **43%** reduction in esophageal squamous carcinoma
- **39%** reduction in stomach cancer

These findings are consisitent with other studies showing that **estrogen** reduces these digestive tract cancers. [63,64]

A review published in early **2018** suggests that **natural progesterone**-based menopausal hormone replacement therapy can help maintain bone density and, compared to synthetic progestogens, possibly reduce risk of breast cancer.[44]

Role of Alcohol and Other Lifestyle Factors

A study of **postmenopausal** women evaluated the impact of various lifestyle factors on breast cancer incidence including alcoholic beverage consumption, body mass index, and reported levels of physical activity.

Findings from this **2017** published study revealed that, in women age 65 and over, the following lifestyle factors were associated with greater odds of breast cancer as follows:[45]

- Lifetime **alcohol** intake: **79%** increase
- High **body mass index:** **83%** increase
- Low level **physical activity:** **31%** increase

The authors concluded their **2017** report by stating:

"Interventions targeting modifiable lifestyle factors may reduce the burden of postmenopausal breast cancer among older women."[45]

As it relates to alcohol consumption, this represents a troublesome conundrum, as some studies show that those who abstain completely from alcohol have shorter lifespans, often related to increased risk of occlusive arterial disorders such as ischemic stroke.[46-48]

Even moderate alcohol consumption has been shown in previous studies to increase breast cancer risk, however.[49-51]

How to Neutralize Deadly Estrogen Metabolites

One cancer-causing mechanism of alcohol is how it impacts the way the body metabolizes estrogens, specifically the 2/16α hydroxyestrone ratio.

High levels of ***16α-hydroxyestrone*** have been correlated to greater risk of breast cancer.[52-54]

Consumption of **cruciferous vegetables** containing compounds like **indole-3-carbinol** (I3C) enables the body to convert estrogens into more ***2-hydroxyestrone*** which has a far weaker estrogen effect than ***16α-hydroxyestrone.***[55]

Other studies show that higher alcohol consumption increases **estradiol** levels in pre- and postmenopausal women.[56-58]

The consistency of findings relating alcohol intake to higher and more dangerous **estrogen** metabolites points to the importance of testing one's urinary levels of **total estrogens** including ***2-hydroxyestrone*** and ***16α-hydroxyestrone***.

If blood or urinary levels of **estrogens** and/or metabolites (such as ***16α-hydroxyestrone***) are imbalanced in women who choose to continue drinking alcohol, then perhaps the use of an **estrogen drug** should be discontinued.

Women with elevated ***16α-hydroxyestrone*** should eat more **cruciferous vegetables** or take supplements that provide plant extracts such as **I3C**.

What Should Hormone-Deprived Women Do?

We at **Life Extension** have long advocated for a compounded estrogen drug that consists of about **80% estriol** and **20% estradiol**.

This ideally should be in the form of a **cream** that is rubbed on to the skin for direct absorption into the bloodstream.

In response to a petition filed by a pharmaceutical company, the FDA has obstructed the use of the **estriol** form of estrogen. This provided the company who lobbied the FDA with a more exclusive market to sell their horse urine-derived estrogen drug (Premarin®).

We suggest that **synthetic progestogens** should be avoided and **natural** (bioidentical) **progesterone** cream applied as per our Female Hormone Replacement protocol (www.LifeExtension.com/female).

Summary

The data described in this article help corroborate **Life Extension**'s longstanding position to avoid **synthetic progestogen** drugs.

Natural progesterone cream makes a lot more sense as it relates to protecting against estrogen-induced cancers and helping to maintain bone density.

For women suffering **menopausal** issues who don't want to use **estrogen**, or can't find a doctor to properly prescribe bioidenticals, a new **plant extract** has shown remarkable benefits in **human** studies.

To read the science behind this new botanical formulation, turn to **page 28** of this month's issue.

For longer life,

William Faloon, Co-Founder
Life Extension Buyers Club

Blood and Urine Tests To Measure Estrogens

Many readers of this publication have annual **blood tests** to evaluate their levels of hormones including **estradiol, progesterone**, and **DHEA**. These are included in the popular **Female Panel**.

For women seeking a more elaborate review of their hormone status as it relates to many of the risk factors described in this editorial, a **Female Hormone Replacement Panel** blood test is available for **$189**.

Women seeking an even more comprehensive review of their overall hormone status, including ***estriol, 2-hydroxyestrone, 16a-hydroxyestrone*** (and many others), can order a **Complete Hormone Profile** urine test for **$299**.

A review of the many tests included in each of these two hormone profiles can be found at LifeExtension.com/estrogens

To order these blood or urine tests today, call **1-800-208-3444** (24 hours).

A Flawed Backdated Analysis

In **July 2002**, the world was shocked to learn of findings from the **Women's Health Initiative** study showing women using **horse urine-derived estrogen** and **synthetic progestogens** had small increases in breast cancer, heart attacks, strokes, and blood clots.[65]

The Women's Health Initiative is a long-term national health study focused on strategies for preventing heart disease, breast and colorectal cancer, and osteoporotic fractures in postmenopausal women. Launched in **1993**, the Women's Health Initiative enrolled 161,808 women aged 50-79 into one or more randomized clinical trials.[66]

Findings from the Women's Health Initiative, which was supported by the **National Institutes of Health**, resulted in letters being mailed to women prescribed **horse urine-derived estrogen** and **synthetic progestogens** warning them to stop taking the drugs because the risks outweighed the benefits.[65]

Follow-up studies and analyses later showed these risks were most likely caused by the **synthetic progestogen** used in Provera® and Prempro®.

As I finalized this article, a retrospective analysis was published that would appear to contradict what you've read about the risks associated with **synthetic progestogens**.[67]

This backdated analysis of patient records renders its findings highly suspect for reasons that include:

Unlike the **Women's Health Initiative**, this retroactive analysis was not a placebo-controlled study. It instead looked at women who followed more than one hormone therapy protocol. As a default, the analysis assigned each woman to the hormone protocol of longest duration. This is an invalid approach, since the type of drug and duration of usage **overlapped**, which creates **residual confounding** (distorted data).

Drug **dosage** was frequently unavailable, so the analysis made the **assumption** that each of the **nine** different hormone therapy categories had a similar pattern of drug usage. This is an invalid assumption, and creates **residual confounding** because **bioidentical hormone** replacement has a very different individualized dosage pattern than use of the one-size-fits-all conventional hormone approaches with **synthetic progestogens** and (usually) conjugated equine estrogen (horse-derived estrogen) drugs.

The analysis included data as far back as 1983 when very few women used or had even heard of **bioidentical** (natural to the human body) **hormones**.

Beyond the technical jargon, perhaps the strongest reason this contradictory analysis should be **disregarded** is that the **Women's Health Initiative** was a much larger study that was tightly-controlled, vetted, and reanalyzed over the past 16 years with consistent findings. The results of this backdated analysis claiming that horse estrogen combined with synthetic progestogens reduce breast cancer risk is contrary to most additional data available on the topic, yet high quality data remain elusive.

Findings from the **Women's Health Initiative** have changed the way healthcare providers prevent and treat some of the major diseases impacting postmenopausal women. Results from the Women's Health Initiative Hormone Trials have been estimated to have saved $35.2 billion in direct medical costs in the United States alone.[66]

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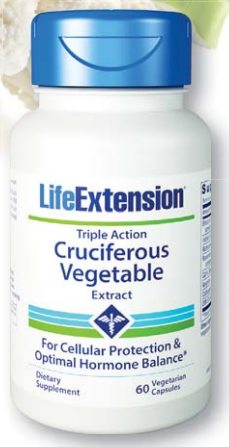

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Olive Oil Associated with Lower Mortality Risk

A study reported at the American Heart Association's Epidemiology and Prevention/Lifestyle and Cardiometabolic Health Scientific Sessions 2018 revealed a lower risk of dying from any cause among subjects who consumed greater amounts of **monounsaturated fat** from olive and other vegetable oils, as well as avocados and seeds.*

The study included 29,966 men enrolled in the Health Professionals Follow-Up Study and 63,412 women from the Nurses' Health Study. Dietary questionnaires administered every four years provided information concerning the intake and source of monounsaturated fat.

Over the 22-year follow-up period, 20,672 deaths occurred, including 4,588 deaths from heart disease. Subjects whose intake of monounsaturated fatty acids from plants was categorized as high had a **16%** lower risk of all-cause mortality in comparison with those whose intake was low.

Editor's Note: In contrast, having a higher intake of monounsaturated fat from animal sources, including red meat, poultry and full-fat dairy products, was associated with a greater risk of death during follow-up.

*Available at: https://tinyurl.com/y888bkyr. Accessed July 23, 2018.

Curcumin Benefits Memory, Mood

A double-blind trial revealed the positive effect of **curcumin** on memory and mood in people with mild, age-related cognitive decline.*

The trial included 40 participants between the ages of 50 and 90 years who had mild memory complaints without dementia. Subjects received curcumin or a placebo twice per day for 18 months.

Cognitive tests were administered at the beginning of the study and at six-month intervals. Thirty participants received positron emission tomography (PET scans) at the beginning and end of the treatment period to assess the presence of brain amyloid and tau, which are increased in Alzheimer's disease patients.

Participants who received curcumin had significant improvements in memory and attention at the end of 18 months, while subjects who received a placebo showed no effects.

Editor's Note: Memory tests revealed a **28%** improvement in the curcumin group and PET scans showed less amyloid and tau in the amygdala and hypothalamus of the brain, which control memory and emotional functions, in comparison with participants who received a placebo.

* *Am J Geriatr Psychiatry.* 2018 Mar;26(3):266-277.

Folic Acid Lowers Stroke Risk

A meta-analysis of 11 trials found an association between supplementation with **folic acid** and a lower risk of stroke.* Folic acid is the synthetic form of folate, an essential B vitamin.

Tao Tian and associates selected 11 randomized trials involving a total of 65,790 cardiovascular disease patients for their analysis.

Participants received folic acid (with or without other B vitamins) and control subjects received a placebo or usual care. Folic acid doses ranged from **0.5 mg** to **5 mg** of folic acid per day for follow-up periods of 12 to 87 months, during which 2,826 stroke events occurred.

By pooling data from all participants, the researchers determined that those who received folic acid had a **10%** lower risk of stroke compared to the control subjects.

Editor's Note: Both folic acid and folate, along with vitamins B6 and B12, can help lower homocysteine, a potentially toxic amino acid which, when elevated, is associated with a greater risk of cardiovascular events. Among men and women who had at least a **25%** reduction in homocysteine, supplementation with folic acid was associated with a **15%** decrease in stroke risk.

**Am J Med Sci.* 2017 Oct;354(4):379-387.

Just-Published Protocol in the *Disease Prevention and Treatment Book*

The scientists and writers at **Life Extension®** continuously update the online *Disease Prevention and Treatment* protocol chapters based on the latest research. A recent update is briefly summarized here with complete versions of these chapters and references available online at: lifeextension.com/Protocols.

Maintaining a Healthy Microbiome

The human body contains about as many microbial cells as it does human cells. Collectively, these microbes form our *microbiome,* and maintaining a healthy microbiome is essential to maintaining overall health. Research in recent decades has just begun to uncover the potential health benefits of manipulating the microbiome with dietary and lifestyle modifications and targeted dietary supplementation.

Novel and emerging therapies targeting microbiome health, such as fecal transplants and phage therapy, are beginning to reshape the way doctors approach treating patients with certain diseases, especially those involving the gastrointestinal tract.

Life Extension's new *Maintaining a Healthy Microbiome* protocol summarizes the importance of the human microbiome for immunity, digestion, metabolism, and more. The protocol reveals exciting new findings in microbiome research and the benefits of microbiome-targeted interventions and specific probiotics.

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Fast-Acting Liquid Melatonin is a popular way to achieve more rapid sleep onset.

The nice-tasting vanilla flavor enables convenient "drop" dosing of ***Fast-Acting Liquid Melatonin*** each night or when needed.

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Caution: Consult your healthcare provider before taking this product if you are being treated for a medical condition (especially autoimmune or depressive disorders). Use caution if combining with alcohol. This product is not intended for children, pregnant or lactating women, or women trying to become pregnant. Do not attempt to drive or operate heavy machinery after taking this product.

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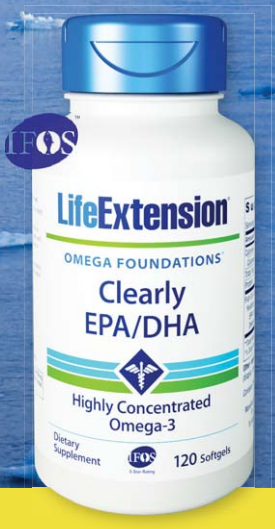

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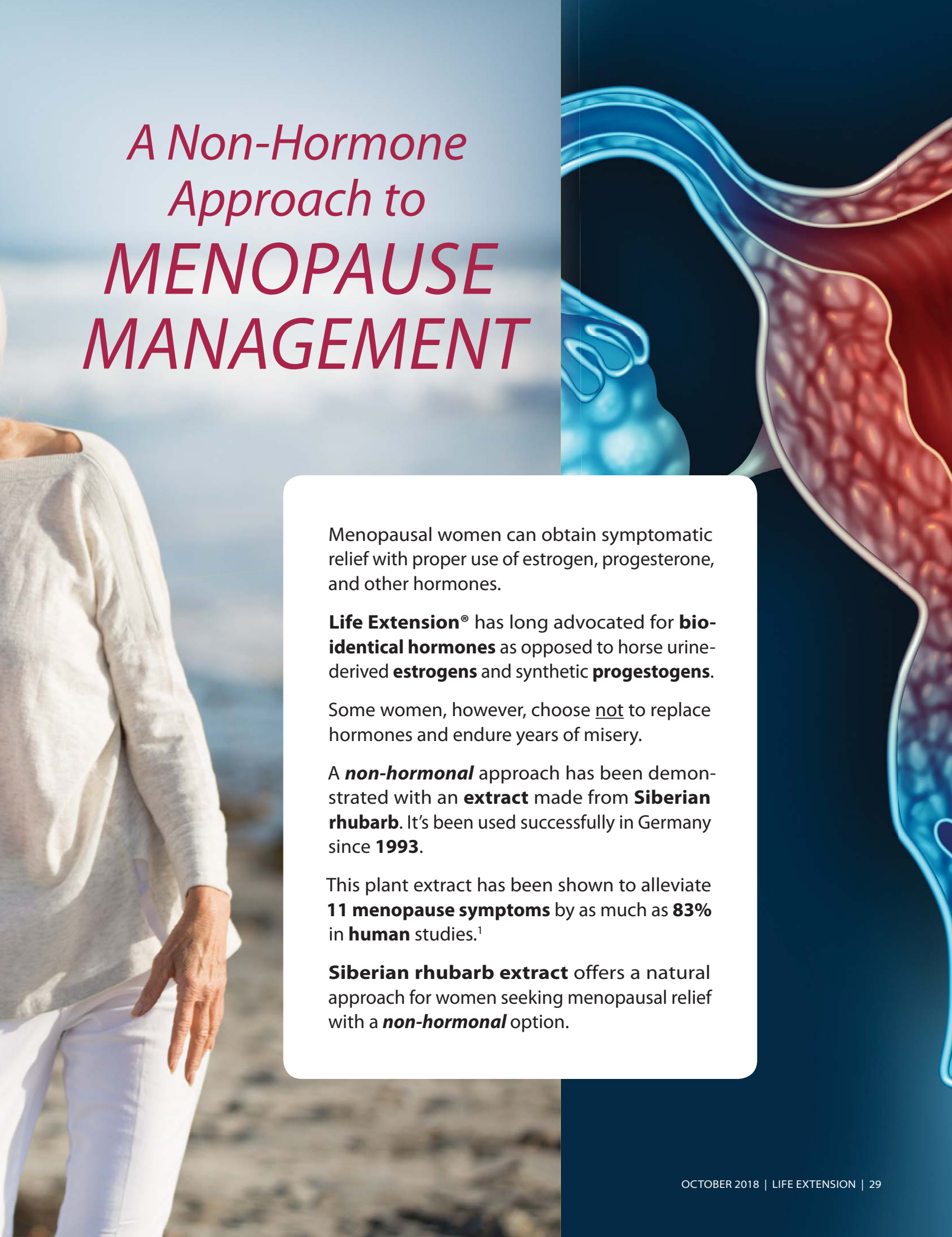
BY STEPHANIE CLARK

A Non-Hormone Approach to MENOPAUSE MANAGEMENT



Menopausal women can obtain symptomatic relief with proper use of estrogen, progesterone, and other hormones.

Life Extension® has long advocated for **bio-identical hormones** as opposed to horse urine-derived **estrogens** and synthetic **progestogens**.

Some women, however, choose not to replace hormones and endure years of misery.

A ***non-hormonal*** approach has been demonstrated with an **extract** made from **Siberian rhubarb**. It's been used successfully in Germany since **1993**.

This plant extract has been shown to alleviate **11 menopause symptoms** by as much as **83%** in **human** studies.[1]

Siberian rhubarb extract offers a natural approach for women seeking menopausal relief with a ***non-hormonal*** option.

Understanding Menopause

Menopause is a change of life that no woman can avoid.

It's characterized by symptoms that may include hot flashes, night sweats, mood changes, sleep disturbances, vaginal dryness, and more.[2,3]

The **Menopause Rating Scale** identifies **11 separate symptoms** suffered by women in various stages of menopause.[4,5] Most of these symptoms are brought on by a decline in a primary female hormone, **estrogen**.

Estrogen is known for its "feminizing" properties on the breast, uterus, and ovaries. It also affects tissues throughout the body, including bone, brain, heart, and vascular tissues, skin, and even lung and fat tissues.[6]

The sharp and often sudden drop in estrogen drives most menopausal symptoms.

Many women relieve menopausal symptoms with hormone therapies, but not all women are comfortable with hormone drugs.

The Issue with Standard Treatments

Estrogen binds to specific **cell receptors**, depending on their locations.

Two important estrogen receptors are found throughout the body, but tend to be concentrated in different tissues.

- **Estrogen receptor-*alpha*** (ER-alpha) is primarily found in reproductive (breast, ovary uterine) tissues. When activated, it produces strong effects on female sex organs.[6]
- **Estrogen receptor-*beta*** (ER-beta) is found in peripheral tissues, where it produces non-sexual effects that sustain tissue flexibility and function.[6]

Replacing the missing estrogen with *nonselective* hormone drugs activates the ***ER-alpha*** and ***ER-beta*** receptors. This can be a double-edged sword, however.

Activating ***ER-beta*** promotes *beneficial* estrogenic effects on skin, brain, bone, cardiovascular, and other tissues.

The problem is that estrogen drugs simultaneously activate ***ER-alpha*** that can produce *undesirable* growth in reproductive tissues, including initiating and promoting **cancer**.[6]

Inducing activity of the ***ER-alpha*** receptor is the prime suspect in the ill effects of conventional hormone therapy.

A better approach is to *selectively* activate the ***ER-beta*** receptor, while having only a minimal effect on the ***ER-alpha*** receptor. That way a woman can promote the beneficial estrogen effects on tissues and organs throughout the body, while avoiding the potential cancer-promoting effects of estrogen on reproductive tissues.[6]

Fortunately, scientists have found a natural compound that can safely do exactly that, i.e., selectively activate primarily the ***ER-beta*** receptor.

An Alternative Way to Treat Menopause Symptoms

An extract from the roots of the **Siberian rhubarb** plant has been used in **Germany** since **1993** for menopause symptoms.[7]

This standardized extract has the **highest selectivity** for ***ER-beta*** over ***ER-alpha*** compared to **natural estrogen** or any other known natural compounds.[8,9]

The root of **Siberian rhubarb** is rich in ***hydroxystilbene*** compounds including ***rhaponticin*** and ***desoxyrhaponticin***.[3,7,8]

These **rhubarb** compounds bind to the beneficial **ER-beta** receptors—the receptors more predominant in skin, brain, bone, heart, and other body areas that suffer during the menopausal estrogen decline.

This **Siberian rhubarb** extract binds only weakly to **ER-alpha** receptors.

Laboratory studies show that **Siberian rhubarb extract** exerts an ***ER-beta*** activation **13.5-fold** greater than its undesirable ***ER-alpha*** effects.[8,9]

Targeted Action

Hot flashes are one of the most well-known symptoms of menopause. They occur in part with fluctuations in estrogen levels.[10]

Rats that have had their ovaries removed are often used as models of human menopause. These animals go through similar temperature elevations as humans, providing a direct way to measure the impact of an intervention.

Research shows that **Siberian rhubarb extract** has similar effects on **temperature control** as *estradiol*, the main form of **natural estrogen**. The difference is in its impact on ***ER-alpha*** and ***ER-beta***.

Compared to estradiol, **Siberian rhubarb extract** had much greater selective ***ER-beta*** impact on genes in the animals' hypothalamus, where temperature regulation and other processes are governed.[9,11] It had very little impact on ***ER-alpha*** receptors, confirming previous lab work.

The true test came in using the plant extract on real women experiencing real menopause symptoms. Siberian rhubarb extract passed that test with flying colors.

Comprehensive Menopause Management

Clinical studies, together examining more than 400 peri- and postmenopausal women, have now evaluated the effects of a **4 mg** daily dose of **Siberian rhubarb extract**.[1,3,7,12,13]

These studies all used the official **Menopause Rating Scale** or the newer **MRS-II**, both of which evaluate a total of **11 menopause symptoms**.

Overall, the studies showed that **Siberian rhubarb extract** consistently reduced the total **Menopause Rating Scale** symptom severity by up to **83%**.

Some women experienced relief as early as four weeks after starting the supplement—and the results lasted up to two years with continuous use of the extract.[1,3,7,12,13]

What You Need to Know

Menopause Relief

- **All women will undergo menopause. The options that can help alleviate the full spectrum of menopausal symptoms are limited.**
- **An extract of Siberian rhubarb has been in use for more than two decades for menopausal symptoms in Germany.**
- **Multiple human studies have shown that Siberian rhubarb extract significantly reduces all 11 of the recognized menopausal symptoms.**
- **In addition to experiencing fewer hot flashes, women taking Siberian rhubarb extract can expect broad spectrum improvements in menopause symptoms, including better mood and better sleep.**

What's more, in addition to reducing the number of hot flashes, Siberian rhubarb extract also led to a significant reduction in mood symptoms such as anxiety and depression—an area where standard conventional treatments often fall short.[1,12,13]

Let's briefly examine each study.

Improves All Measured Menopause Symptoms

The first study was a randomized, double-blind, placebo-controlled trial that included 109 perimenopausal women with multiple symptoms. Results for this initial study were reported in two separate publications.[3,13]

The women received **4 mg**/day of **Siberian rhubarb extract** or a placebo for 12 weeks.[3,13] Then they were evaluated using the **MRS II** and the **Hamilton Anxiety Score** (reported in a separate publication).

By the end of the study period, ***total*** symptom severity scores fell in the **Siberian rhubarb** extract group by **54%**, and there were significant improvements in all **11** symptom categories.[3] Placebo recipients had no significant changes, and they continued to experience severe menopausal symptoms.

A few years later, scientists conducting a similar study achieved virtually identical results.[12] For this study, 112 symptomatic perimenopausal women took **4 mg**/day of Siberian rhubarb extract or a placebo for 12 weeks.

Once again, the results showed:[12]

- Overall MRS scores dropped by **54%** in the supplemented group.
- Significant improvements in ***all 11 of the MRS symptom categories***, including an **83%** reduction in the median number of daily hot flashes.
- No significant changes in placebo recipients.

A separate review of 24 placebo-controlled trials found that using conventional hormone therapy reduced the frequency of **hot flashes** by about **75%**.[14] This shows that **Siberian rhubarb extract** achieves similar results compared to conventional hormone replacement therapy for hot flash reductions.

Siberian rhubarb extract is also effective for reducing the other MRS symptoms. Importantly, as the next section explains, this includes the all too often overlooked **mood problems** associated with menopause.

Boosting Mood

Conventional hormone drugs mostly address hot flashes and night sweats, but often fall short on improving mood symptoms such as anxiety and depression. There is even some evidence that conventional treatments can aggravate these symptoms.[15,16]

Siberian rhubarb extract is able to reduce the number and severity of hot flashes to a similar extent as conventional hormone replacement therapy, while also improving **mood-related** symptoms that are not addressed, and are sometimes exacerbated by conventional treatments.[3,12,14]

Comparing Siberian Rhubarb Extract to Placebo

Changes in Depressed Mood Symptoms From Baseline[13]

	Siberian Rhubarb Extract	Placebo
Patients experiencing **remission** of mood and anxiety symptoms	**30.2%**	**1.8%**
Patients experiencing **improvement** of symptoms	**60.4%**	**23.6%**
Patients experiencing **no change** in symptoms	**9.4%**	**69.1%**

Specifically, one study showed that **60%** of those taking Siberian rhubarb extract experienced an *improvement* in **depressed mood** symptoms, while the placebo group's symptoms deteriorated during that time.[13]

Of special note, in one of the papers that arose out of this study, **Siberian rhubarb** extract produced a **66%** reduction in total scores on the **Hamilton Anxiety Scale**.[13] The table on the previous page describes the changes from baseline in the depressed mood symptoms category of the scale.

Long-Term Impact

In order to evaluate the **long-term** efficacy of **Siberian rhubarb extract**, researchers tested it in an open-label follow-up study over 108 weeks (just over two years).[1]

Women who had been taking the extract in a previous double-blind study continued their supplementation, while women who had received placebo began supplementing with the active extract at the end of the prior trial.

Women in the former placebo group rapidly caught up with their peers once they started the active supplement, achieving identical results of up to an **83%** reduction in total **MRS II** scores by the end of the study.[1] After two years of taking the extract, hot flashes decreased from about **15** a day to an average of just **1.4** a day.[1,3]

Life Extension®'s Position on Bioidentical Hormone Replacement Therapy

Siberian rhubarb extract is a unique, ***non-hormonal*** approach to controlling menopausal symptoms, and provides an alternative to hormone replacement therapy.

Hormone replacement therapy in general aims to restore the desirable functions of estrogen in women whose levels are falling as a consequence of menopause. Conventional hormone drugs are often combinations of oral conjugated estrogens derived from pregnant horse urine and synthetic progestins (progestogens). Synthetic progestins are associated with safety risks including raised risks of breast cancer, heart disease, stroke, and blood clot.[18]

Bioidentical hormone replacement therapy uses hormones identical to those produced in the human body. Because it may be associated with fewer side effects than conventional therapy, bioidentical hormone replacement has become the choice of many women.[18]

Women using bioidentical hormone replacement therapy should continue to use the treatment if it is providing relief.

For those women who prefer to use a *non-hormonal* approach, **Siberian rhubarb** extract is an appealing alternative that provides relief for all 11 symptoms on the Menopause Rating Scale.

For more information on **Life Extension**'s position on bioidentical hormone replacement therapy, please see the **Life Extension Female Hormone Restoration Protocol** at **www.LifeExtension.com/female**.

Mental and Physical Improvements

In the largest study, 252 women took **4 mg**/day of the **Siberian rhubarb extract** for six months.[7]

This study is important because it included women beginning to enter menopause (peri-menopausal), as well as those who were past the menopausal transition but still had concerning symptoms.

This study reaffirmed the ability of **Siberian rhubarb** extract to significantly reduce *every* one of the 11 MRS symptoms. It also showed a **52%** reduction in the overall MRS scores.[7]

The Menopause Rating Scale

The Menopause Rating Scale, or MRS, was developed in 2004 as a way of standardizing menopausal symptoms. The MRS is a comprehensive tool for the evaluation of a woman's menopausal symptoms. The MRS contains 11 symptoms, each of which is rated on a severity scale ranging from 0 (indicating that the symptom is not present) to 4 (5 on the **revised MRS II**) indicating "very severe."[3-5]

The 11 symptoms measured on the MRS include:

- Hot flashes, sweating
- Heart discomfort
- Sleep problems
- Depressive mood
- Irritability
- Anxiety
- Physical and mental exhaustion
- Sexual problems
- Bladder problems
- Vaginal dryness
- Joint and muscle discomfort

Siberian rhubarb extract is a non-hormonal approach that safely reduces scores on each of the MRS symptoms, as well as the total score, at a daily dose of just **4 mg**.[1,3,7,12,13]

These reductions were significant after three months, and were followed by additional symptom relief over the next three months.

Women whose symptoms were most severe reported the largest overall improvements. In the entire group, the most prevalent reductions were in some of the most commonly reported symptoms:

- Hot flashes/sweating
- Sleep problems
- Irritability
- Depressed mood

The ability to improve mood symptoms is a big part of what sets **Siberian rhubarb extract** apart from conventional hormone drug therapy[16]—and will no doubt be welcomed by perimenopausal women who struggle with depression.

Safety Profile

It should be noted that no relevant safety issues arose in any of the studies of Siberian rhubarb extract cited here, which together involved more than 400 women. No changes in breast, vaginal, or endometrial tissues were seen, nor were there changes in laboratory parameters or vital signs.

During the time that these studies were being carried out, **6.7 million** doses were sold in Germany each year.[1,17]

Summary

Hot flashes are the most troublesome menopausal symptoms for most women, but it is important to remember that they are just one of 11 menopausal symptoms recognized by experts.

While conventional hormone replacement is considered effective for hot flashes, it leaves much to be desired in providing relief from the other kinds of menopausal symptoms.

A non-hormonal extract from the root of the **Siberian rhubarb** plant has been in widespread use in Germany since **1993**.

In human studies, this extract significantly relieved all 11 recognized menopausal symptoms, including both hot flashes and depressed mood.

Women taking bioidentical hormone replacement therapy for hot flashes should continue to use it when effective. For those interested in broad-spectrum, ***non-hormonal*** relief of menopausal symptoms, Siberian rhubarb extract will be an attractive option.

Women who are past their menopausal years, but do not feel as young as they did prior to onset of menopause, may consider trying **Siberian rhubarb** extract to see if it improves their sense of well-being. ●

Natural Progesterone Replacement

This article focuses on a novel way that maturing women can obtain desirable **estrogenic** effects without the potential harms associated with conventional hormone replacement. The importance of **natural progesterone**, however, should not be overlooked.

Since the early 1990s, **Life Extension** has recommended topical application of **natural progesterone cream** for its many benefits. These creams are available from compounding pharmacies with a doctor's prescription and in lower-potency, over-the-counter forms for dermal application.

Some women also use oral **pregnenolone capsules** (**50**-**100 mg**/day) that can be converted to natural progesterone in the body.

Like the hormone estrogen, progesterone levels decline as women go through menopause. Restoring these sex hormones can improve quality of life and potentially reduce risk of several degenerative conditions.

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

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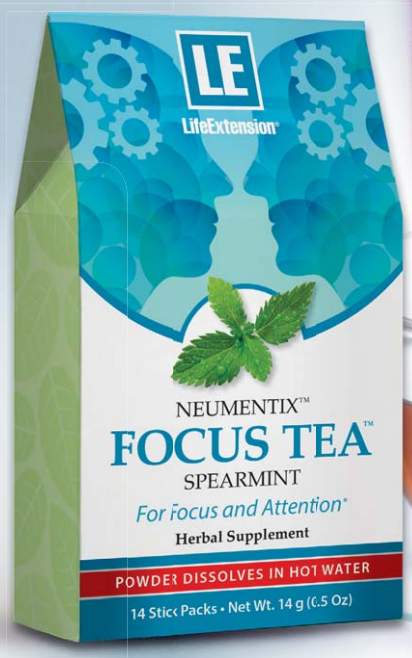

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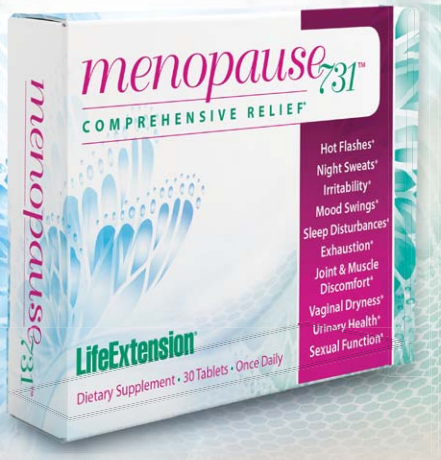

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BY MICHAEL DOWNEY

How Aged Garlic Extract Can Slash Heart Disease Risk

Since the 1950s, scientists have been researching **garlic**, with particular focus on heart health.[1]

Garlic has been shown to help reduce heart disease risk factors, including atherosclerosis, elevated cholesterol, thrombosis, and high blood pressure.[1-3]

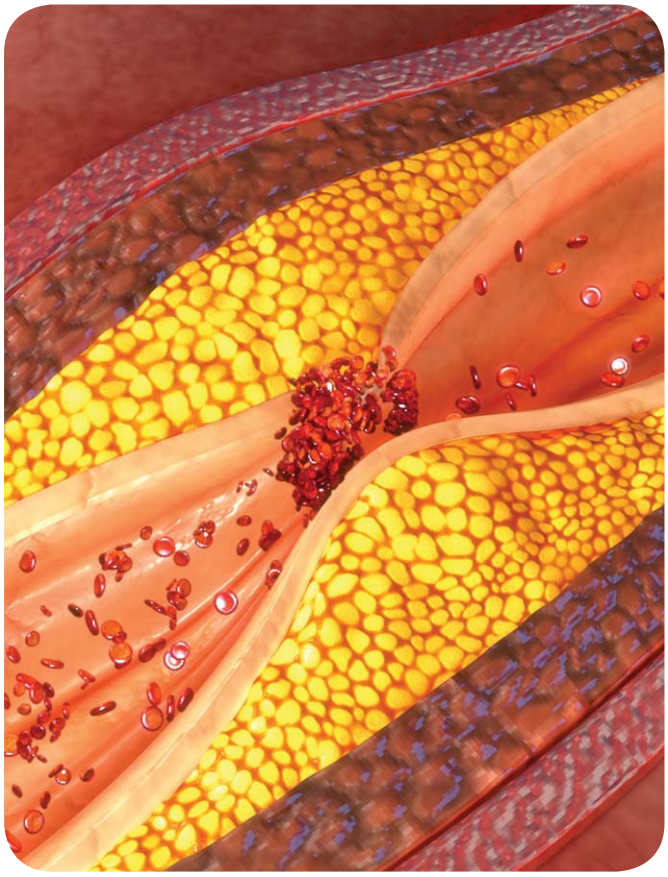
For those seeking these broad-range cardiovascular benefits, **aged garlic extract** is the best **validated** form from a clinical study perspective.

Broad Cardioprotective Effects

Garlic is high in unique **sulfur compounds** that are responsible for its scent, taste, and beneficial effects—including its broad benefits for heart health.

An exhaustive **2016** review published in the *Journal of Nutrition* cited heart benefits seen with garlic supplementation, including:[1]

- A reduction in **systolic blood pressure** of **7-16 mmHg**,
- A reduction in **diastolic blood pressure** of **5-9 mmHg**,
- A decrease in **total cholesterol** of **7.4-29.8 mg/dL**,
- Favorable effects on reducing the progression rates of **coronary artery calcium** (calcium deposits in the coronary arteries, which is indicative of atherosclerotic plaque),
- Improved **pulse wave velocity** (a measure of arterial stiffness),
- Reduced **C-reactive protein** (higher levels of which indicate inflammation), and
- Overall general safety.



Aged Garlic Extract, a Potent Form of Garlic

Many different forms of garlic preparations are used for supplementation, but research on **aged garlic** extract stands out.

The long-term aging of garlic in diluted alcohol, without heat, produces unique and potent compounds—including ***S-allylcysteine*** and other ***S-allyl*** compounds. These sulfur-based constituents have powerful oxidant-reducing qualities. A number of other beneficial compounds may also be produced by the aging process.[4,5]

Adding to the collective findings of the **2016** review, newer studies on the cardioprotective effects of ***aged*** garlic extract have revealed remarkable results.

One of the most compelling effects of **aged garlic extract** is its ability to help ***reverse*** early heart disease. It accomplishes this by stripping deadly plaque buildup from artery walls.

In a randomized, double-blind study, researchers gave **metabolic syndrome** patients (aged 40 to 75) either a placebo or **2,400 mg** of **aged garlic extract** daily. Then they assessed their coronary arteries—those that supply blood to the heart—for plaque.[6]

Follow-up screening a year later showed that those taking the garlic experienced slower accumulation of total plaque compared to the placebo group. More impressively, there was a regression of "**low-attenuation**" plaque.[6]

Low-attenuation plaque is soft plaque. Reducing this type of plaque has a significant stabilizing effect on atherosclerosis.

This ability to inhibit—and even **reverse**—arterial plaque buildup constitutes a critical reduction in the risk of atherosclerosis.

Anti-Inflammatory Benefits

Chronic inflammation plays a role in the formation and progression of atherosclerotic plaques.

Aged garlic extract has been shown to inhibit inflammation.[7]

A **2017** study gave **aged garlic extract** to highly atherosclerosis-susceptible mice for 12 weeks.

Mice receiving aged garlic extract experienced the following reduction in heart attack risk factors compared to control mice that did not receive aged garlic extract:[7]

- C-reactive protein (CRP) by **39%**,
- Tumor necrosis factor alpha (TNF-alpha) in the liver by **35%**,
- Thromboxane B2 (TXB2) by **33%**, and
- Interleukin-1 receptor-associated kinase 4 (IRAK4) by **60%**.

The study author described these results as an "anti-atherosclerotic effect."[7]

Similar anti-atherosclerotic effects have been demonstrated in **humans** as well.[8]

For example, scientists set out to assess the effects of aged garlic extract on adipose (fat) tissue in humans. Increased adipose tissue is seen as a marker for atherosclerosis progression and is associated with the severity of coronary artery calcium.[8]

In this randomized, placebo-controlled trial, 60 volunteers were given either a placebo or **aged garlic extract** (combined with arginine, folate, and vitamins B6 and B12). After one year, the group taking the aged garlic extract had reduced their growth rates of several types of adipose tissue.[8]

Reduced Cholesterol Levels

Elevated cholesterol levels are a factor in plaque buildup. In a **2018** study, aged garlic extract exhibited beneficial effects on cholesterol *and* inflammation levels.[9]

The researchers divided 51 obese participants into two groups: One took a divided daily dose of **3,600 mg** of aged garlic extract and the other took a placebo.

After six weeks, the aged garlic extract *reduced* blood LDL (bad) cholesterol. It also modified the secretion of inflammatory proteins, indicating that the extract may help prevent chronic diseases associated with low-grade inflammation—such as cardiovascular disease.[9]

What You Need to Know

Garlic Combats Cardiovascular Disease

- **Garlic's health benefits have been recognized for thousands of years.**
- **Garlic has numerous cardioprotective effects, including preventing or improving atherosclerosis, high cholesterol, and high blood pressure.**
- **Aged garlic extract contains unique and potent compounds—including *S-allyl-cysteine*—that fight oxidative stress.**
- **Published studies reveal marked reductions in a range of vascular disease risk factors.**

Lower Blood Pressure

Aged garlic extract has been shown to reduce blood pressure in both lab studies and in humans.[10,11]

One team of scientists found that aged garlic extract was able to relax aortic tissue in rats by increasing production of **nitric oxide**,[10] a compound known to dilate blood vessels and lower blood pressure.[12]

Another **2017** study involved a comprehensive review of nutraceuticals that have "clinically detectable," blood pressure-lowering effects. According to this review, compounds in **aged garlic extract** known as polysulfides—the compound S-allylcysteine, in particular—enhanced the regulation of nitric oxide, which in turn induces smooth muscle-cell relaxation, vasodilation, and blood pressure reduction.[11]

The study author concluded that "a relatively large body of evidence" supports the use of aged garlic extract to lower blood pressure.[11]

Also, a review and meta-analysis published in the *Journal of Nutrition* assessed numerous randomized, controlled, human trials over a 58-year period to determine garlic's capacity to lower both **cholesterol** and **blood pressure**.[13]

The researchers found that **aged garlic extract** reduced systolic blood pressure by an average **4.1 mmHg**.

But in the participants who had high blood pressure, **garlic extracts** provided a larger decrease in blood pressure—an average reduction of **8.7 mmHg** in the systolic and **6.1 mmHg** in the diastolic reading.[13]

This indicates that garlic extracts work best in those who need it most.

The author also noted a previous meta-analysis showing that taking garlic extracts for over two months led to a **10%** reduction in total and LDL cholesterol in patients with slightly elevated cholesterol levels.[13]

These results led the author to conclude:

"Garlic supplements are highly tolerated and may be considered as a complementary treatment option for hypertension, slightly elevated cholesterol, and stimulation of immunity."[13]

Endothelial Function and Vascular Elasticity

Scientists conducted a double-blind, placebo-controlled, randomized clinical trial to test the effect of aged garlic extract on endothelial function and vascular elasticity—two important factors in the prevention of atherosclerosis.[14]

Sixty-five firefighters—subject to *occupational stress*—were randomized to receive either a placebo or **aged garlic extract** plus **coenzyme Q10**.

After one year of quarterly visits, the researchers documented a mean **decrease** in **vascular stiffness** in the **aged garlic/CoQ10** group, as well as a significant **improvement** in the index of **endothelial function**.[14]

The study author concluded that aged garlic extract plays an important role in the prevention of atherosclerosis—even in challenging subjects such as those with chronic occupational stress.[14]

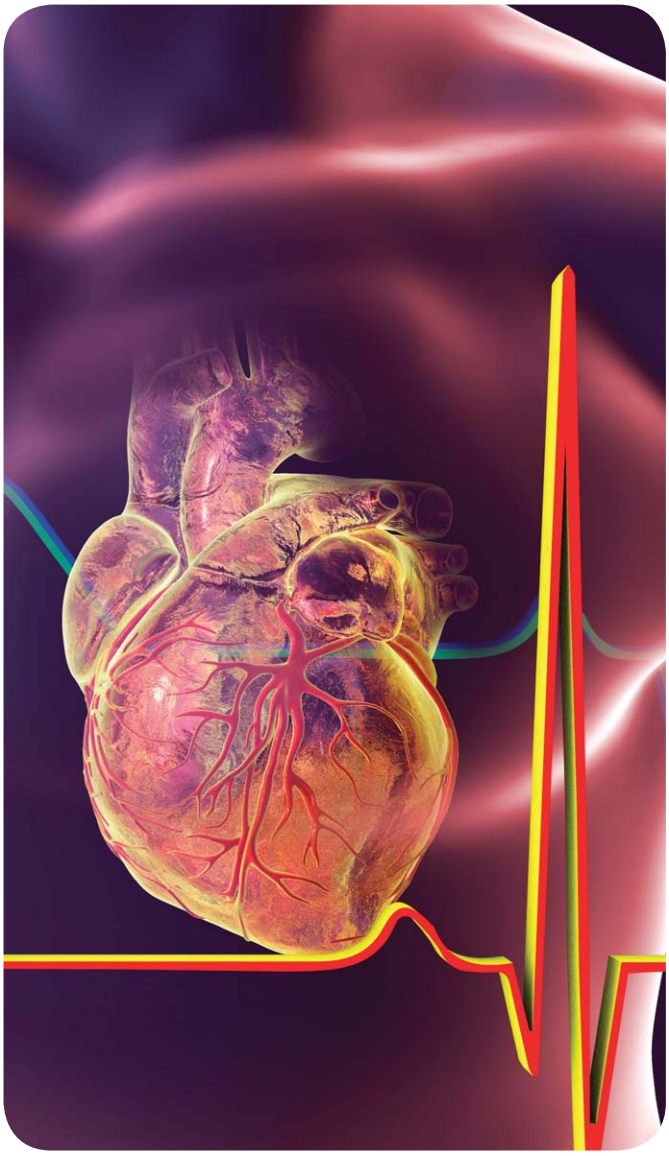
Collectively, these studies validate the ability of **aged garlic extract** to help protect against heart disease.

Summary

Garlic has been long recognized for its cardioprotective activity, but scientific validation of its heart benefits didn't begin until the 1950s.

Aged garlic extract has well-documented mechanisms recognized to protect against heart disease risk factors. ●

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 KATHY PARKER

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- ✓ Statins
- ✓ Valproic Acid
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Using ***Off-Label Drugs*** *for* ***Cancer Prevention*** *and Adjuvant* ***Treatment***

This year, more than **600,000** Americans will perish from cancer.[1]

Millions endure harsh treatments that are often only partially effective.

Many of these human tragedies are avoidable.

Overlooked by oncologists are commonly used **drugs** that have demonstrated activity against **cancer**.

These include over-the-counter medications like **aspirin** and **cimetidine**, and prescription drugs like **statins** and **metformin**.

In addition to combatting factors that initiate cancer, studies show that some of these drugs can help reduce the ***risk of dying*** from cancer.

In this article, we'll review how six drugs that are approved by the **FDA** for other indications can be used **"off-label"** as ***adjuvant*** (meaning "in addition to") therapies to help prevent, eradicate, or slow the progression of different types of cancer.

Aspirin: An Old Friend with a New Indication

Aspirin was originally derived from willow bark and has been used to ease fevers and inflammation for 3,500 years.[2-4]

Aspirin has an ability to inhibit *enzymes* that make **pro-inflammatory** signaling factors.[5] This enables aspirin to reduce platelet activation which makes it useful for preventing blood clots that form in coronary arteries and cause heart attacks.

These same mechanisms also have a role in aspirin's **anti-cancer** effects.

Once cancer has formed, **activated platelets** contribute to its spread (metastasis) while **inflammation** fuels tumor growth.[6,7] Aspirin's ability to combat these actions makes it effective in reducing cancer incidence and death.[7]

The benefits of aspirin have become so apparent that the U.S. Preventive Services Task Force now recommends using aspirin to prevent colorectal cancer and cardiovascular disease in certain groups of people.[8,9]

A pooled analysis of two large population-level studies provides validation of this recommendation.

In a long-term study of over 100,000 people, regular aspirin use was associated with a significant overall reduced risk for developing **cancer**. This reduction was primarily due to its ability to reduce the risk of intestinal cancers—especially colorectal cancers.[8]

The benefits of aspirin in this study were evident even at doses of **162 mg** to **490 mg** of aspirin per **week**. People had to be taking aspirin for at least **six years** to show this cancer-preventive benefit.[8]

A number of other studies document the potential of **low-dose aspirin** to protect against many other malignancies, including pancreatic, breast, lung, ovarian, esophageal and stomach (see **Table 1**).

Cancer patients should consider taking an enteric coated aspirin, with a dose range of **81 mg** to **325 mg** per day.

Life Extension® has provided data about using **aspirin** as an adjuvant cancer treatment for decades. Yet most patients and their doctors overlook aspirin because it sounds too simplistic.

The underlying data, however, reveals probable efficacy. Since there is no money to be made promoting aspirin as an adjuvant cancer therapy, it is unlikely to achieve the recognition it deserves.

Cimetidine: More than Just Heartburn Relief

The drug **cimetidine** (brand name **Tagamet®**) was among the first pills designed to relieve heartburn. It works by blocking ***histamine receptors*** in the stomach lining that promote acid secretion.

Cimetidine has demonstrated *multiple* anti-cancer effects.

For example, it can reduce levels of ***adhesion molecules*** that help cancer cells stick to cells lining the inside of blood vessels—an action that can prevent local invasion and **metastasis**.[10-13]

Table 1: Aspirin Effects on Risk of Developing Cancers

Cancer Type	Aspirin-Associated Reduction in Risk* of Developing Cancer
Breast[67]	10%
Lung[68]	13%-26%
Ovary[69]	15%
Uterine lining (endometrium)[70]	7%
Stomach[71]	30%
Colorectal (Risk of Recurrence of Polyps)[72,73]	20%-25%

*Compared with non-use of aspirin

Cimetidine has also been shown to:[10,11,14-18]

- Mobilize natural killer cell activity and other immune factors that attack cancer cells.
- Block an increase in T-suppressor cells that prematurely turns off certain immune functions.
- Reduce activity of signaling pathways that stimulate new blood-vessel formation (angiogenesis), a requirement for tumors to nourish themselves during rapid growth.

Back in 1985, **Life Extension** first recommended cimetidine as an adjuvant cancer treatment. Since then, many scientific papers have documented the remarkable survival improvements in cancer patients using this drug.[19]

In one study, gastric cancer patients received either cimetidine (**800 mg** per day) or placebo immediately after surgery or the decision not to operate. Median survival in the cimetidine group was 450 days compared to 316 days in the placebo group.[20]

A meta-analysis found that taking cimetidine resulted in a **47%** improvement in overall survival in colorectal cancer patients who underwent curative surgery, compared with those who did not.[12]

Studies indicate the importance of cancer patients to initiate cimetidine five days before surgery and to continue taking **800 mg** a day for one year after surgery (in addition to standard therapies).

Statin Drugs: Evidence in Human Trials

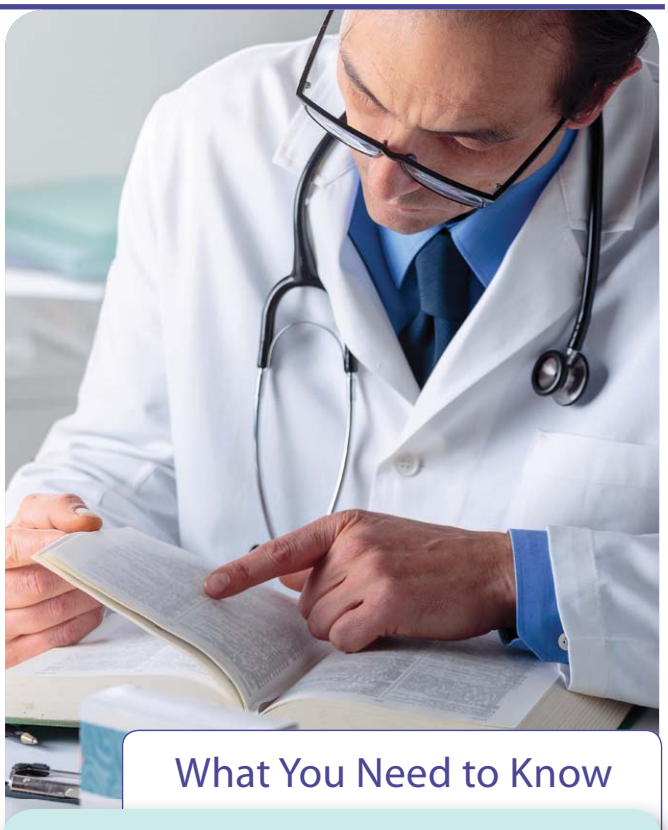
Statin drugs were developed to lower blood cholesterol levels. These drugs block an *enzyme* that the liver uses to make cholesterol, which results in less cholesterol production and hence lower blood cholesterol levels.[21-23] Many people avoid long-term statin use because of side effects.

When it comes to **cancer**, however, the side effects of statins may be tolerable if there is clinical indication that anti-cancer effects are manifesting.

Some tumor cells require copious activity of the same *enzyme* pathways involved in producing cholesterol. Statins block the production of those biochemical building blocks.[21] This ability makes statins potentially appealing for cancer prevention if one also requires them to lower elevated LDL cholesterol.

Statins can also function as **AMPK activators**, which contributes to their anti-cancer effects.

Intriguing results have been reported for a variety of cancer types, including breast, prostate, pancreas, kidney, and liver (see **Table 2** on the next page).



What You Need to Know

Off-Label Drugs for Cancer Prevention

- **Despite scientific progress, we still have a long way to go in the war on cancer.**
- **As scientific knowledge grows about what causes cancer to develop to begin with, we are finding that numerous drugs that were developed for other indications ultimately have important anti-cancer effects.**
- **Drugs such as statin medications, aspirin, valproic acid, metformin, beta-blockers, and cimetidine all have mechanisms of action that impact the basic processes that promote cancer development, invasion, and metastases.**
- **Most of these drugs have multitargeted effects that enable them to block pro-malignancy processes at multiple checkpoints.**
- **As a result, numerous studies have shown that many of these drugs can reduce the risk of developing—or dying from—cancer.**

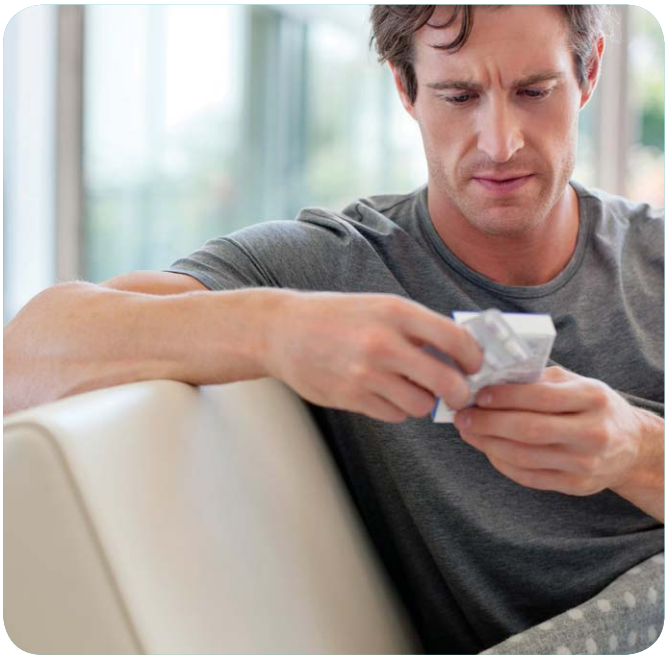
Table 2: Statin Effects on Cancer Survival by Type of Malignancy

Cancer Type	Statin-Associated Risk Reduction* for:		
	Dying from Any Cause	Dying from Cancer	Having a Recurrence of Cancer
Breast[23]	NR**	30%	36%
Prostate[62]	44%	47%	NR**
Prostate[63]	NR**	32%	12%
Pancreatic[64]	NR**	25%	NR**
Kidney[22]	26%	33%	NR**
	Statin-Associated Reduction in Risk of *Developing* Cancer		
Liver[65]	40%		
Liver[66]	56% (Asian); 51% (Caucasian)		

* Compared with non-use of statins; ** NR = Not Reported in Study

It's important to note that not all statins are alike in their anti-cancer benefits. Those that dissolve better in fats (called ***lipophilic*** statins) consistently show better results than those that dissolve best in water (***hydrophilic*** statins).[23-25] **Atorvastatin**, **lovastatin**, and **simvastatin** are ***lipophilic***, whereas **pravastatin**, **rosuvastatin**, and **fluvastatin** are more ***hydrophilic***.[26]

We at **Life Extension** are well aware of the challenges and concerns with statin drug use. We've published articles in the past advocating for lower dose and every-other-day statin use for those with elevated LDL who cannot reduce it with diet and lifestyle changes.[27-30]



Still, we can't ignore published findings indicating potential adjuvant cancer treatment benefits.

For those battling cancer, a lipophilic statin should be considered, such as **atorvastatin** with a dose range of **20 mg** to **80 mg** per day. The higher doses may only be tolerable for a few weeks and dosage reduction can be considered if tumor markers and imaging results indicate clinical improvements. There are not yet specific guidelines available in the published literature to indicate how long a cancer patient should consider using statins as adjuvant treatment.

Valproic Acid: Multiple Mechanisms of Action

Valproic acid is derived from valeric acid, a compound naturally found in the valerian plant (*Valeriana officinalis*).[31]

Valproic acid's primary medical use is to treat and prevent epileptic seizures, though new properties are coming to light.

One of the most exciting of these findings is valproic acid's impact on cancer cells. It has been shown to have at least four different mechanisms of action against cancer:

- It can inhibit *enzymes* that selectively "close" segments of chromosomes for transcription of genes.[32] In cancer, this remarkable property can promote the transformation of "generic" cells into healthy cells rather than cancerous ones.[32-34] Thus, valproic acid has the ability to help determine a cell's fate.

- Valproic acid acts on signaling pathways that decrease the growth and spread of tumors in animal models. This is due in part to its ability to stop the cell cycle**,** which essentially "freezes" cancer cells in the midst of uncontrolled proliferation.[35-37]

- Valproic acid induces natural, programmed cell death, or ***apoptosis***. Cancer cells lose the ability to succumb to apoptosis. This allows them to reproduce without limit, essentially making them "immortal."[32,36,38-41]

- Valproic acid can make malignant cells more "visible" to the immune system's ***natural killer*** cells, helping them identify and destroy emerging tumors.[33]

Animal and cell culture studies have now shown that valproic acid exerts one or more of these anti-cancer effects in numerous types of tumors, including ovarian, cervical, salivary gland, pancreas, thyroid, and head-and-neck cancers.[33,35,37-40] It has also been found to have synergistic effects with aspirin in damaging liver cancer cells in culture.[41]

A meta-analysis showed that patients with the brain tumor *glioblastoma multiforme* may live longer when treated with valproic acid.[42]

And several other early safety and dosing studies have established that valproic acid is safe and well tolerated.[42-44]

Cancer (especially glioblastoma) patients should consider **valproic acid** at a dose of **25 mg** per kilogram of body weight per day.

Metformin: Multitargeted Biotherapy

Metformin is a drug with true multitargeted properties. Originally derived from the French lilac plant (*Galega officinalis*), metformin has been the gold standard for treating type II diabetes for several decades and has accumulated an impressive record of safety and effectiveness.[45-48]

Over time, evidence began to emerge showing that diabetic patients treated with metformin had lower incidence—and higher survival rates—of several cancers, compared to those not treated with metformin.[48-50]

Indeed, one **2017** study showed that diabetics taking metformin had a **7%** reduction in all-cause death rates compared with nondiabetics.[51] This is an interesting finding given that diabetics typically die sooner than nondiabetics. Also of note, the diabetics taking metformin were **28%** less likely to die than diabetics taking other therapies.[51]

Metformin can alter how cells manage energy and how they read out genetic information. Both are crucial factors in the progression from a single malignant cell into a deadly tumor.

By one mechanism, metformin activates the **AMPK complex**, a master metabolic regulator that controls how and when food energy is either used or stored. "Switching on" AMPK leads to a cascade of events that slow or stop cell proliferation in cancer.[48,50,52]

Via a second mechanism, metformin shuts down genes in tumor-promoting pathways, further helping to inhibit cell proliferation.[52]

Metformin also reduces blood glucose and insulin levels. Cancer cells use glucose and insulin to fuel their rapid proliferation.

Metformin reduces the risk of pancreatic cancer through antidiabetic and antitumor actions.[53] Research shows that metformin users (including diabetics) have a significantly lower risk for developing pancreatic cancer.[54]

In a controlled study at MD Anderson Cancer Center, the risk of pancreatic cancer was **62%** lower in diabetics who had taken metformin compared to those who had never taken it.[55]

Human studies provide strong evidence for metformin's important role in cancer prevention and mitigation, as shown in **Table 3**.

Cancer patients should consider **metformin** at a dose of **1,000 mg**, two times a day with meals.

Beta-Blockers: Fight Cancer by Blunting Stress Effects

Our bodies respond to stress with an immediate burst of the "fight-or-flight" neurotransmitters epinephrine (adrenaline) and norepinephrine. This has the beneficial effect of ramping up heart rate, blood pressure, and overall vigilance to better enable us to cope with a threat.

But ***chronic*** stress causes the continuous outpouring of these potent neurotransmitters—even when there is no obvious threat. This can promote the growth and spread of tumors by activating their cell-surface receptors, which causes cells to lose their regulation over replication.[56]

Drugs called ***beta-blockers*** reduce the harmful impact of epinephrine and norepinephrine on heart rate and blood pressure. But because these drugs act by blocking the adrenaline receptors, they are also likely to reduce the impact these neurotransmitters have on cancer progression.

Human studies show intriguing potential.

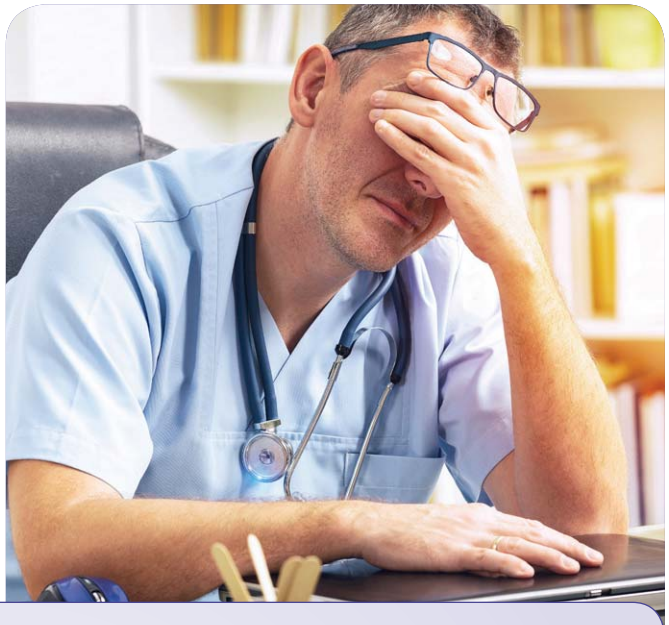


Table 3: Metformin Effects on Cancer Risk and Survival

Cancer Type	Metformin-Associated Risk Reduction* for:		
	Dying from Any Cause	Cancer Progression	Developing Cancer or Pre-Malignant Lesion
Lung[74]	23%	47%	
Pancreas[75]	22%	NR**	
Pancreas[76]	23%	NR**	
Endometrium (Uterine lining)[77]	42%	39%	
Endometrium[78]	18%	NR**	
Endometrium[79]	36%-50%	NR**	
Endometrium[80]	49%	37%	
Colorectal[81]	18%	NR**	
Stomach[82]			24%
Colorectal Polyp (pre-malignant lesion)[83]			24%
Liver Cancer in Diabetics[84]			48%

*Compared with non-use of metformin; ** NR = Not Reported in Study

In an observational study of 1,340 diabetics, those taking **beta-blockers** had a **67%** lower overall risk of cancer compared with those not taking the drugs. Further analysis showed a **13%** reduction in cancer risk for each month of exposure to beta-blockers.[57]

The specific cancers with the most compelling research in this area are breast and prostate cancer.

One meta-analysis found that using **beta-blockers** produced a **50%** reduction in the risk of dying from breast cancer, compared with non-users.[56]

Another showed that women who were already using beta-blockers when they were diagnosed had a **56%** improvement in their overall chance of surviving breast cancer.[58]

With regards to **prostate cancer**, a meta-analysis showed that using beta-blockers was associated with a **15%** reduction in the risk of dying from the cancer, compared with non-use.[59]

Please note that choosing a specific dose for beta-blockers is challenging given that most of the studies look at retrospective population groups and specific doses used are not noted. For that reason, a wide range of doses has been used without a specific dose for cancer treatment being identified.

The two **beta-blocker** drugs that demonstrate anti-cancer potential are **propranolol** and **carvedilol**.

For **propranolol**, the *Physician's Desk Reference* lists **80 mg** to **480 mg** for the treatment of hypertension, and **180 mg** to **240 mg** for the reduction of cardiovascular mortality in stable patients with a history of heart attack caused by coronary occlusion.

With regard to **carvedilol**, *Physician's Desk Reference* listed **12.5 mg** to **50 mg** for the treatment of hypertension.

Due to the side effect profile of beta-blockers, work closely with your prescribing physician when considering which one to choose and the appropriate starting dose.

Dosing in the lower ranges of either **propranolol** or **carvedilol** may be considered by cancer patients in coordination with their oncologist.

At the time of this writing, there are direct intervention trials seeking to verify whether certain **beta-blockers** can effectively reduce cancer risks.[60,61] When results of these studies are published, a clearer picture will emerge as to whether these drugs should be considered by healthy individuals. In addition to potential cancer risk reduction, beta-blockers can beneficially lower blood pressure in certain individuals.

Summary

Most cancer treatments still involve some form of chemotherapy, with or without radiation treatment, immune modulation, and/or surgery.

But as the search for a cure continues, new tools are appearing—many of them in the form of drugs that have long been in use for entirely different indications.

A review of the recent literature shows that six widely used prescription and over-the-counter drugs may have considerable efficacy against cancer. Some have mechanisms of action that reduce the size and spread of tumors, while others have been found to improve survival rates in people with cancer.

These drugs act by multiple mechanisms, which give them an edge in fighting **cancer**. That's because cancer cells have the ability to rapidly evolve in order to escape eradication by conventional and alternative treatments.

Anyone interested in reducing their cancer risk should talk to their doctor about taking advantage of drugs that are supported by peer-reviewed published studies, yet overlooked by most of the oncology establishment. ●

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

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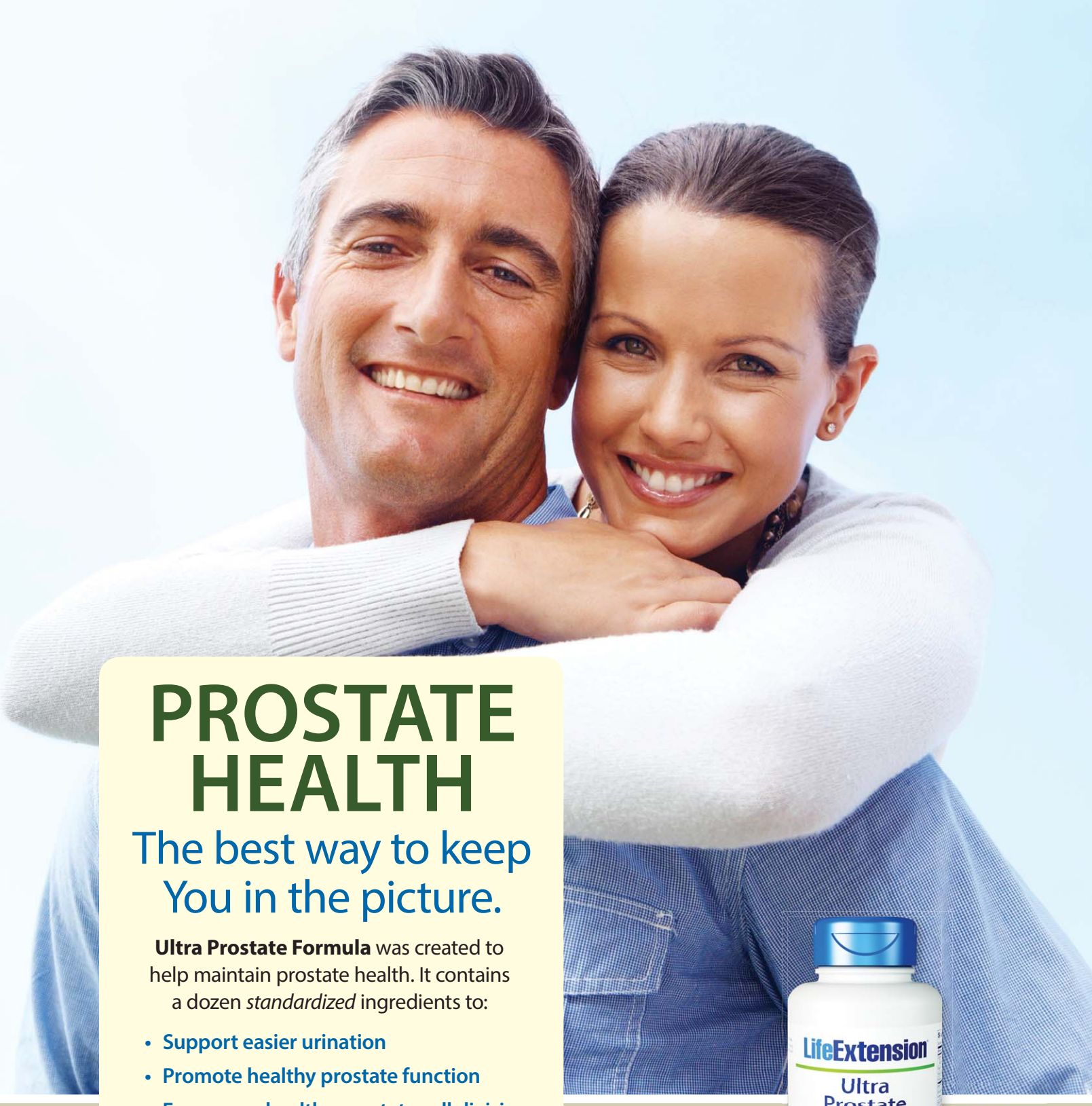

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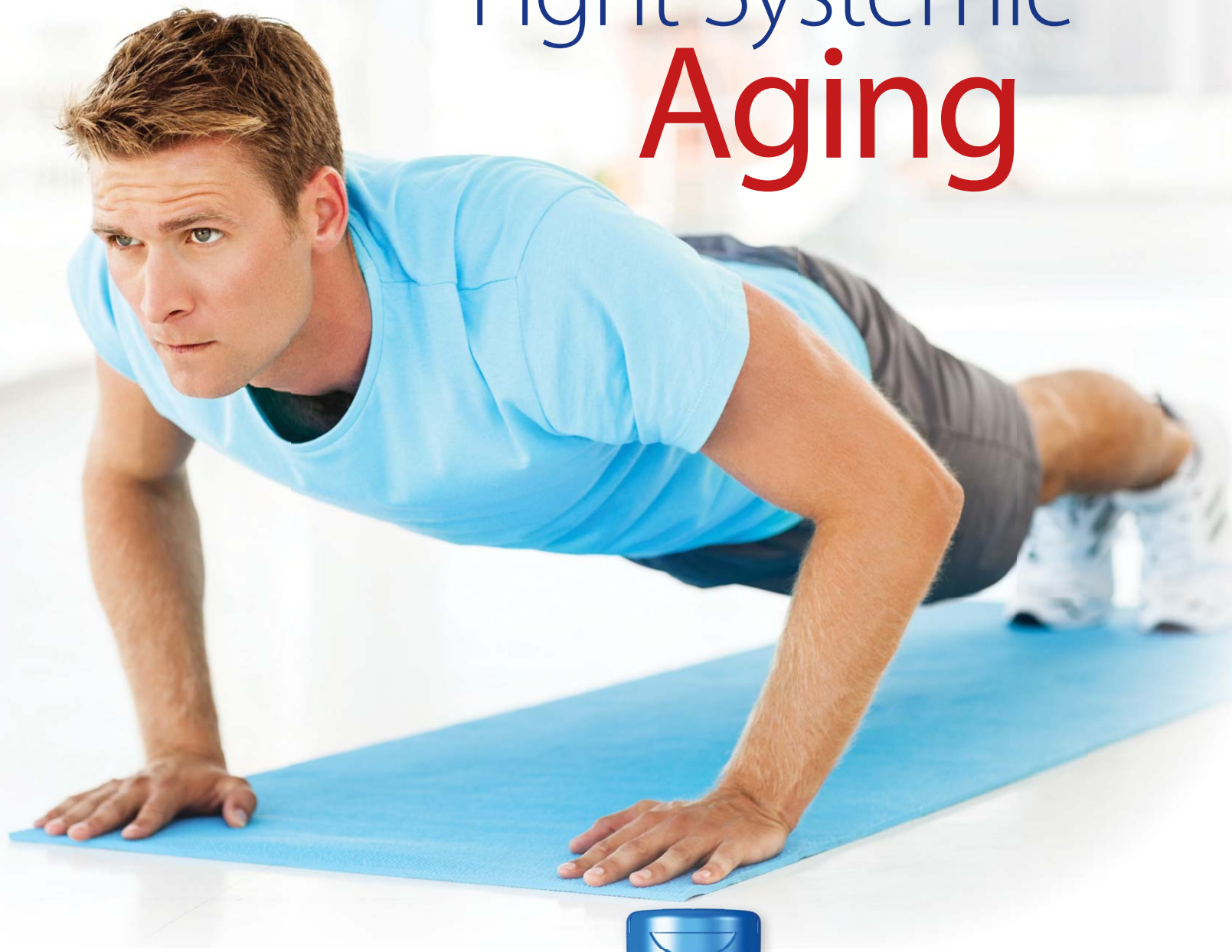

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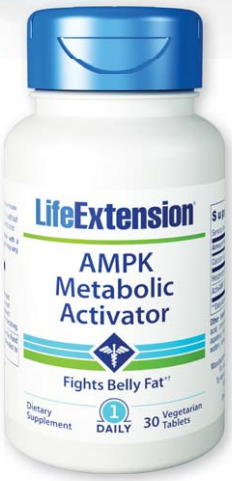

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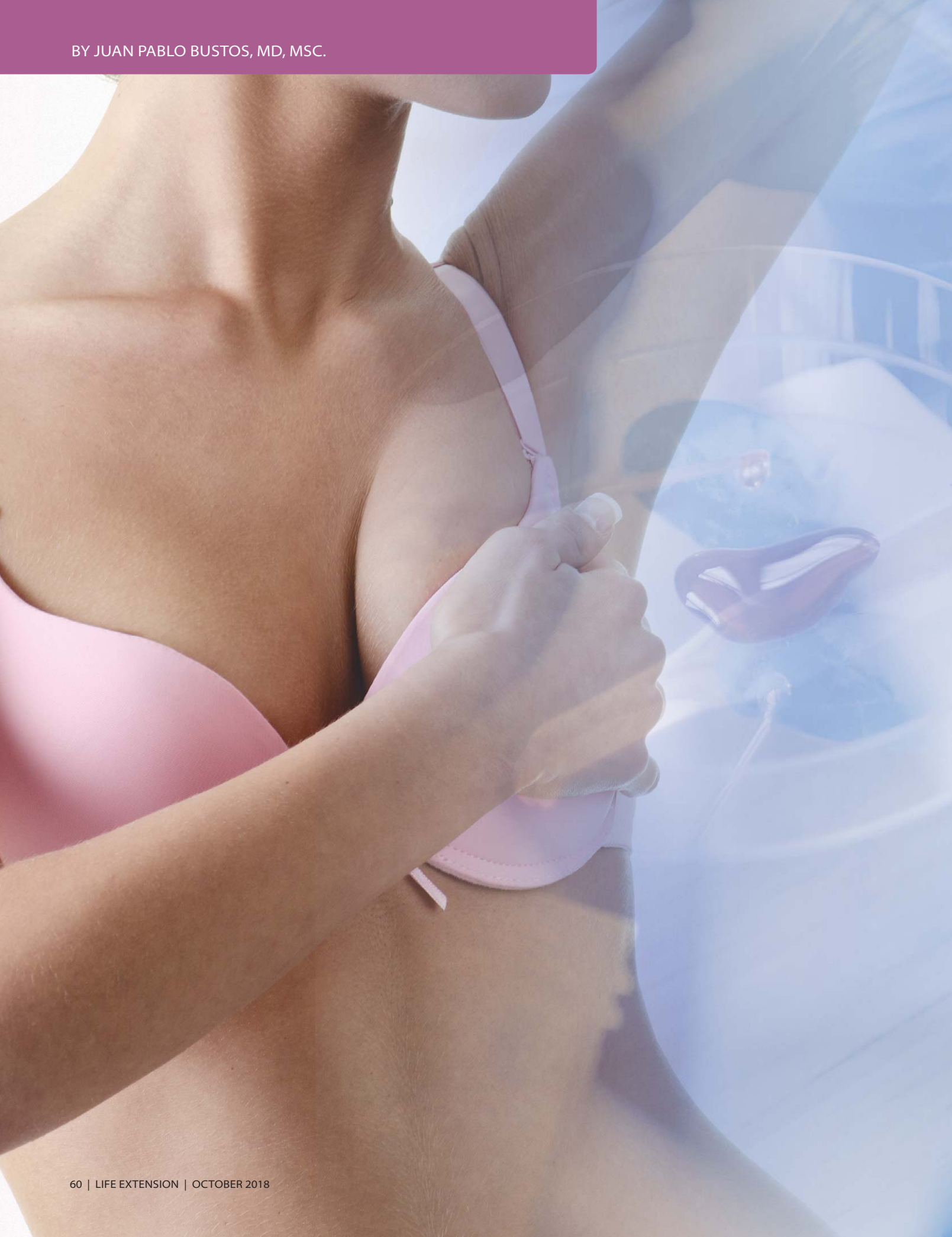


Melatonin

A Promising Protector Against Breast Cancer

Melatonin is best known for helping to induce sleep.

Studies show melatonin may also play a role in the fight against **breast cancer**.

Intriguing research shows that melatonin has an important role in impeding the growth and spread of breast cancer cells.[1-6]

Clinical trials demonstrate how melatonin can boost effectiveness of existing cancer treatments while reducing their side effects.[7,8]

Adding melatonin to the cancer drug **tamoxifen** in a Petri dish made the drug **100 times more potent** as an inhibitor of breast cancer cell growth.[9]

Melatonin can also help combat lifestyle and environmental breast cancer risk factors.

Melatonin's Anti-Cancer Properties

For years, melatonin's medical use has been largely limited to treating the symptoms associated with breast cancer—such as improving sleep[10] and improving depression and anxiety.[11]

New research reveals that melatonin has anti-cancer properties.[6,12] Most notably, lab and animal studies have shown that it can slow or stop the growth and spread of **breast cancer**.[1-6,13]

This is likely due to melatonin's impact on **estrogen**.

About **70%** of breast cancer tumors are growth-sensitive to estrogen,[14] meaning the hormone fuels the cancer's growth. Many breast cancer therapies are aimed at either decreasing circulating estrogen or reducing tumor sensitivity to the hormone.

Melatonin has natural **anti-estrogen** effects. It limits the amount of the enzyme that changes estrogen into a more active form, while also increasing the enzyme that keeps circulating estrogen in an inactive state.[15-23]

Studies done on human breast cancer cells have shown that melatonin reduces the sensitivity of **estrogen receptors** on the surface of breast cancer cells, which reduces the cells' growth response.[24,25]

Melatonin Improves Breast Cancer Therapies

The impact of melatonin's anti-estrogen properties is most obvious in its ability to boost the effectiveness of *tamoxifen*, a commonly used adjuvant breast cancer drug.

Tamoxifen works by blocking estrogen receptor sites, which helps slow the growth and reproduction of many breast cancer cells.

In a study of breast cancer cells, adding melatonin to tamoxifen made the drug **100 times more potent** in inhibiting the growth of those cells.[9] This means that it may be possible to use less of the drug to achieve similar effects—saving money while reducing harmful side effects.

In addition to boosting the effectiveness of certain cancer therapies, melatonin can also reduce their side effects.[7,8]

For example, in an animal study, it reduced the secondary liver damage that may be caused by the drug **letrozole** (another hormone-based treatment for breast cancer).[26]

Another side effect of breast cancer treatment is an increased risk for **osteoporosis**.[27] Melatonin has been shown to prevent the loss of bone tissue by stimulating the production of new bone and decreasing the reabsorption of calcium from the bone, a process that diminishes bone density leading to osteoporosis and increased risk for fractures.[28-31]

Due to its properties as a free-radical scavenger, melatonin may also counter the calcium-depleting effect of free radicals on bone, leading to a more stable bone matrix.[32]

In one randomized, controlled clinical trial, women who received **1** or **3 mg** a day of melatonin for one year showed improvement on bone density markers when compared to women who had received a placebo. Women who received the higher doses of melatonin demonstrated the most marked improvements in bone density.[33]

Because of the beneficial effects of melatonin on preserving bone density and the prevention of osteoporosis, it is reasonable to consider using melatonin in conjunction with common breast cancer therapies.

And when tested in combination with six different chemotherapy drugs (for a variety of different types of cancer), using melatonin (**20 mg/**day) in addition to the drugs resulted in:

- A significantly higher survival rate after one year, and
- Significantly reduced the toxicity of the drugs.[7]

Furthermore, melatonin has been found to make cells from breast tumors more sensitive to the effects of chemotherapy drugs while also preventing resistance to their anti-cancer effects.[34]

Boosting Radiation Effectiveness

Melatonin's effects are equally impressive when used in conjunction with **radiation therapy**.

In one study, when cancer patients undergoing chemotherapy and radiation took melatonin (**20 mg** every night) and a melatonin gargle *during* their seven weeks of treatment, they experienced fewer side effects and were able to tolerate treatment more consistently, compared to a placebo group.[8]

Research done on tumor cells has shown that exposure to melatonin *before* treatment increased the effectiveness of radiation therapy by decreasing cell proliferation.[35]

Melatonin can also help prevent the skin irritation caused by radiation therapy, as demonstrated by results from a clinical trial that used a melatonin-based cream during and after radiation sessions. Women who used the melatonin cream had significantly less skin irritation after radiation treatment compared to a placebo group.[36]

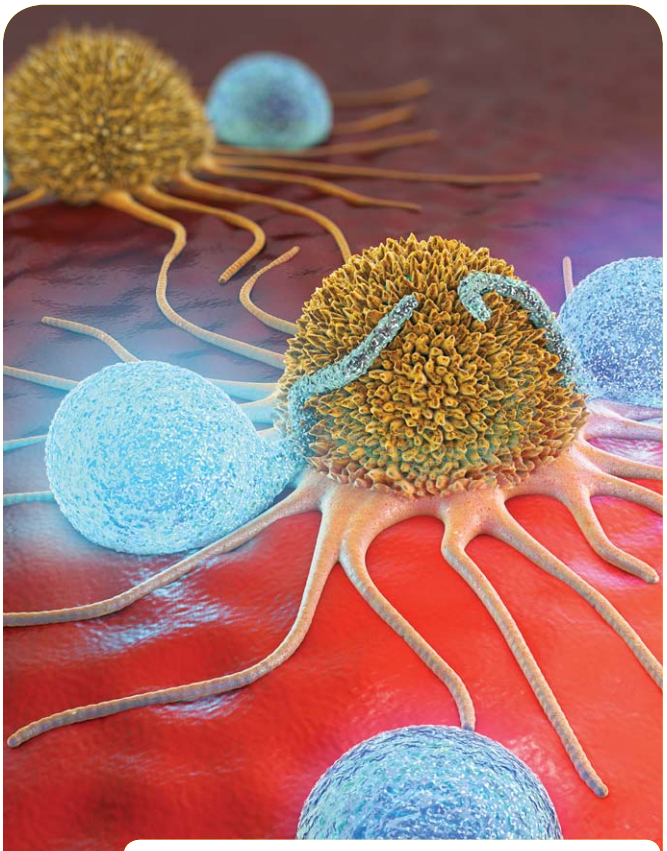
Together, these studies show that using melatonin in addition to breast cancer therapies can enhance their effectiveness while reducing their toxicity.

Melatonin Reduces Environmental Risk Factors

As helpful as it is to be able to boost the effectiveness of breast cancer treatments, the ultimate goal is to avoid developing breast cancer to begin with.

New research has demonstrated a number of ways melatonin can protect cells—or diminish the cell damage—caused by a variety of environmental factors that play a major role in disease development.[37]

- **Tobacco.** Both smokers and those exposed to secondhand smoke face an increased risk for developing breast cancer.[38] Studies in rodents show that melatonin reduces the oxidative damage caused to cells by exposure to cigarette smoke.[39] By reducing the damage to the cell induced by cigarette smoke, many precancerous lesions were either improved or avoided altogether.
- **Acrylamide**. This environmental contaminant is released when certain foods are cooked at high temperatures.[40] Acrylamide can disrupt the normal function of cells by causing oxidative damage and corrupting DNA. Research done in rats showed that melatonin reduced the oxidative damage caused by exposure to acrylamide while also diminishing damage to DNA.[41]



What You Need to Know

Melatonin and Breast Cancer

- **Melatonin, a hormone known for inducing a good night's sleep, has been used for many years in the treatment of symptoms associated with breast cancer.**
- **New research reveals melatonin's anticancer properties, and lab studies show that it can slow the growth and spread of breast cancer.**
- **The addition of melatonin to conventional breast cancer therapies has been shown to boost effectiveness and reduce side effects.**
- **Studies show that melatonin can help protect against breast cancer risk factors, including certain environmental exposures, obesity, and being exposed to light at night.**

- **Polycyclic Aromatic Hydrocarbons.** This group of chemicals is generated by incomplete combustion of fuels such as wood, coal, and gas. Major sources of exposure include residential heating, motor vehicle exhaust, and fossil fuel-intensive industrial processes, including refineries.[42] Animal research shows that these compounds cause cellular changes in breast tissue that lead to the development of tumors.[43] When animals were exposed to a form of polycyclic aromatic hydrocarbons, treatment with melatonin significantly reduced the number and size of tumors.[44]
- **Cadmium.** Cadmium is a ubiquitous environmental contaminant present in the food chain that plays a role in the development of breast cancer.[45,46] A survey conducted in the U.S. revealed a cadmium exposure prevalence of over **93%** of the population.[47] In animal studies, melatonin has been shown to protect against oxidative stress caused by cadmium,[48,49] while also countering the negative effects of cadmium on breast tissue.[50]
- **Light.** Exposure to light *at night* is a commonly overlooked risk factor for breast cancer.[5] Nighttime exposure to light disrupts natural melatonin secretion by the pineal gland,[5,51] raising the risk for developing the disease.[52-56] Supplementing with melatonin has been shown to counter some of the negative effects of exposure to light at night.[57]

Obesity and Breast Cancer

Obesity is a major risk factor for the development of breast cancer, especially among postmenopausal women.[58,59] In one controlled clinical trial, melatonin showed promising anti-obesity effects, which is of great scientific and research interest.[60,61] Melatonin has also shown the ability to reduce some harmful, breast-cancer-inducing effects of obesity.

In one randomized, double-blind, placebo-controlled trial, postmenopausal women who took **1** or **3 mg** of melatonin nightly for a year had significant *decreases* in **fat mass** and *increases* in **muscle mass**, compared to the placebo group.[60]

Research shows beneficial effects of melatonin supplementation in obesity as well as for its related complications.[61]

In postmenopausal women, obesity promotes the overexpression of *aromatase*, an enzyme that stimulates the production of estrogen. In breast tumors, estrogen can reach concentrations up to **10-fold** higher than in blood.[62] Such a high local concentration of the hormone causes tumor initiation and progression.[63]

In addition to its anti-estrogenic activity, melatonin has been shown to inhibit the activity and expression of aromatase.[21]

Summary

Melatonin offers promise for the prevention and management of breast cancer.

In addition to slowing growth and spread of breast cancer cells, melatonin may boost the effectiveness of cancer treatment, while also reducing harmful effects.

Studies show that melatonin helps protect against breast cancer risk factors, including certain environmental exposures, obesity, and being exposed to light at night.

Scientists are considering incorporating melatonin as an adjuvant approach in the treatment of breast cancer. ●

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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Exposure to Light at Night May Increase the Risk for Breast Cancer

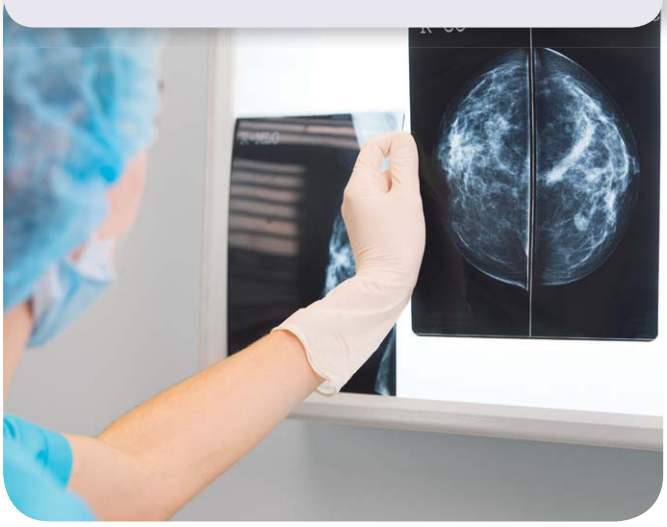
Melatonin plays a key role in the regulation of the body's sleep/wake cycle and helps establish circadian rhythm, the 24-hour schedule of biological processes that cells and systems follow to maintain health and carry out their functions.

In order to maintain a proper circadian rhythm, the body depends on a 24-hour cycle of alternating patterns of light and darkness. Altering these patterns of light and darkness may have an effect on metabolism and cell function. Evidence from several studies shows that exposure to sources of light at night leads to the interruption of circadian rhythm and increases the risk of cancer.

This is especially significant in women who are already predisposed to cancer, such as those with a family history, or who have abnormal BRCA1, or BRCA2 genes that increase the risk of developing breast and ovarian cancer.

Research shows that the light emitted by digital screens (smartphones, tablets, laptops), along with the internet and social networking related activities, could disturb the normal pattern of sleep in humans and have a negative effect on normal melatonin release.

Exposure to light at night has also been associated with other metabolic, psychiatric and behavioral disorders. The World Health Organization has classified night-shift work and exposure to light at night as a "probable carcinogen to humans." Limiting the use of digital screens at night, or using filter applications that diminish light may help reduce the negative effects of exposure to light at night.[64]



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Lutein and Zeaxanthin Protect Vision While Boosting Brain Blood Flow

BY NICK OSTER

There is a direct connection between the **eyes** and the **brain**.

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

The retina consists of certain plant **pigments** that are good indicators of visual health.

Two of those pigments are **carotenoids** called ***lutein*** and ***zeaxanthin***.

Supplementation with these carotenoids helps prevent age-related **vision loss**.[1]

A **2018** study shows that **lutein** and **zeaxanthin** also enhance **cognitive function** by improving ***brain blood flow***.[2]

Improvements in **brain function** occur even if these **carotenoid** supplements are started relatively late in life.

This is exciting news since diminished cerebral **circulation** is a contributor to neurodegeneration.

The Eye/Brain Connection

Carotenoids are yellow-to-orange-colored pigments found in many vegetables. They were originally isolated in **carrots**, hence their name.

Consuming high amounts of certain carotenoids correlates with protection against **macular degeneration** (an eye condition that can lead to blindness), cancer, cardiovascular diseases, and neurodegenerative disorders.[3]

Two carotenoids in particular, **lutein** and **zeaxanthin**, are highly concentrated in the human **retina**. But the more we learn about these nutrients, the more we understand that they are just as important for **brain health** as they are for the **eyes**.[3] That makes sense because the retina is structurally an extension of the brain itself.

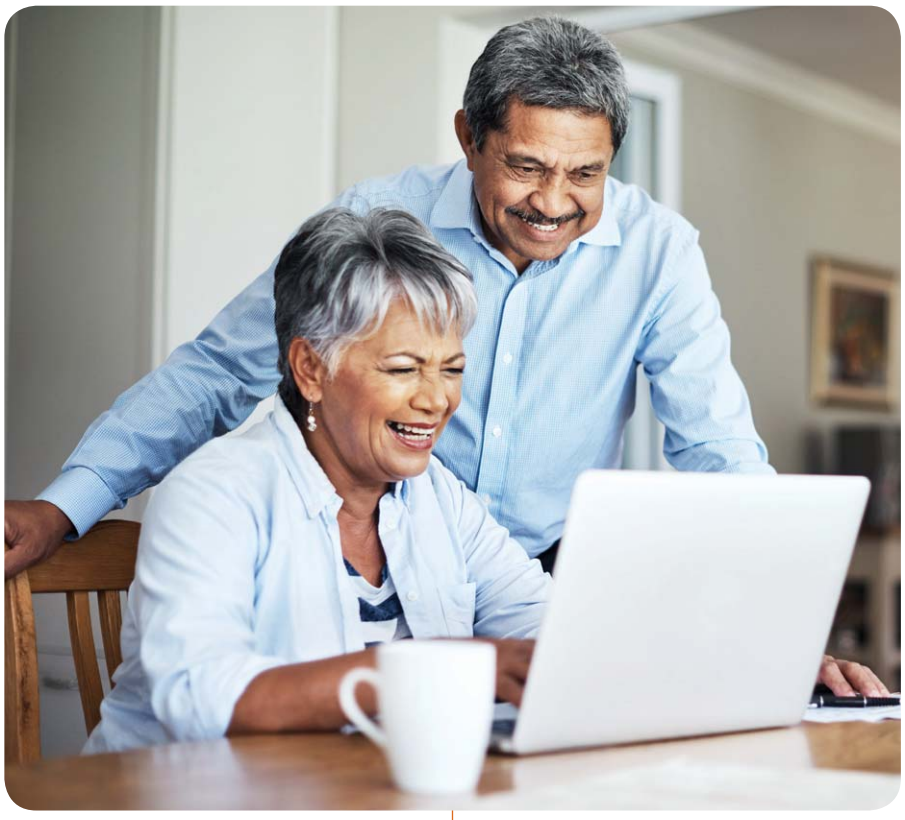
In addition, lutein and zeaxanthin belong to a subgroup of carotenoids called **xanthophylls**, which have recently been identified as the dominant carotenoids in all major **brain** areas.[3,4]

Based on these findings, researchers at the **University of Georgia** carried out the first-ever randomized, controlled trial to test whether supplementation with **lutein** and **zeaxanthin** might be beneficial for **cognitive function** in older **people**.[2]

Lutein and Zeaxanthin Boost Brain Blood Flow

For the study, a group of older adults (averaging **72** years old) took either a placebo or a pill containing lutein (**10 mg)** plus zeaxanthin (**2 mg**) every day for one year.[2]

The researchers used advanced imaging called **functional magnetic resonance** to observe brain activity in real time while subjects performed various tasks involving learning and recall.[2]



This technique gave researchers the unique opportunity to watch areas of the brain **"light up"** during the cognitive tasks in a way that highlighted blood flow to each brain region—a measure that indicates how hard the brain is working on the task at hand.[5,6]

The study had two important findings.

The first was that subjects supplementing with **lutein** and **zeaxanthin** maintained their baseline cognitive performance over the year of the study, while the **placebo** group showed a statistical tendency to decline during the same period.[2] This indicated a favorable cognitive impact of the xanthophyll supplement.

The second finding helps explain why the nutrients had a protective impact on cognition. It showed that supplemented patients experienced significant *increases* in ***brain blood flow*** in areas of the brain vital to cognition and memory. No such activation was seen in those regions in the placebo group.[2]

These findings showed that lutein and zeaxanthin supplements can:

a) Produce a "brain maintenance effect" by shielding against the impact of aging on cognitive performance.

b) Enhance brain blood flow in the specific areas that support that cognitive function.

Supplementing with lutein and zeaxanthin was effective when started at a relatively advanced age (72), with effects that were evident within a year. That's encouraging news for older adults who are in the greatest need for brain function protection.

Additional Support for Lutein/Zeaxanthin as Cognitive Aids

Several studies published in **2017**—one year before the findings just discussed—add support to the connection between xanthophylls and brain function.

For example, one study showed the density of lutein and zeaxanthin in the macula of the retina was positively associated with academic performance in school-age children, further establishing that there is a relationship between what happens in the eye and what happens in the brain.[7]

Also, ***blood levels*** of these xanthophylls in older adults are closely associated with better cognitive, memory, and executive (prioritizing and decision-making) function. Higher blood levels of zeaxanthin specifically are associated with better processing speed.[8]

And we learned that higher lutein and zeaxanthin blood levels—and higher density of these carotenoids in the **retina**—are associated with improved integrity of the brain's ***white matter*** tracts.

White matter tracts are long "cables" that provide network connections between brain regions that are known to deteriorate with age.[9] This type of protection is critical because when white matter deteriorates, it can impact one's ability to move, use sensory faculties, and react to external stimuli.

Finally, a study published online in **2017** showed that supplementation with lutein and zeaxanthin has a powerful effect on the brain, significantly reducing psychological stress and cortisol levels (a blood marker of stress), while contributing to overall improvements in emotional and physical health.[10]

How It Works

Lutein and zeaxanthin offer protective benefits for the **eyes** and the **brain**. Researchers are still investigating why this is the case, but they believe it has to do with their unique biological structure.

Xanthophylls are able to immerse themselves in the fatty brain cell membranes, crossing between the cell's exterior and interior environments.[3] This stabilizes cell structures and protects against oxidative stress from inside and outside the cell.

What's particularly intriguing is that the brain seems to automatically concentrate xanthophylls in the most vulnerable regions of brain cell membranes, where the vital polyunsaturated fatty acids reside. Once there, lutein/zeaxanthin provide neurologically important fats that resist oxidative and physical stresses.[3]

Summary

Lutein and **zeaxanthin** are widely acclaimed for their vision-protecting effects in the macular region of the retina. They have also been shown to support cognitive function and enhance brain blood flow in older adults.

These findings extend previous work that shows a strong correlation between high levels of lutein and zeaxanthin in the eye, improved cognitive function, and protection of brain white matter.

Their unique biological structure permits xanthophylls to bridge brain cell membranes and protect against oxidative stress generated from inside and outside of the cell.

Lutein and zeaxanthin's effects on cognitive function and brain blood flow are evident even when started late in life, which means that the window of opportunity for brain protection is still open, even for older adults. ●

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

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References
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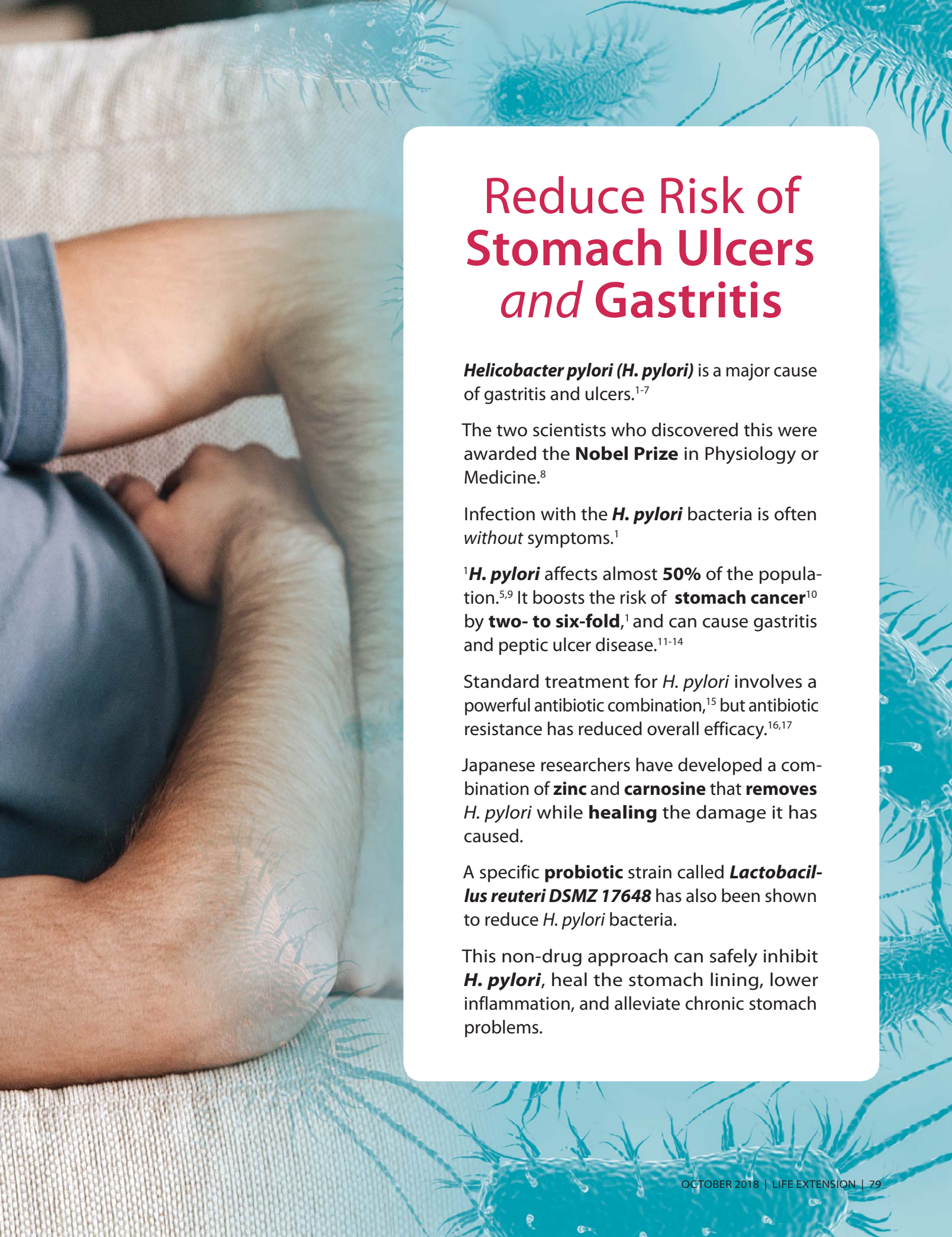
BY MICHAEL DOWNEY



Reduce Risk of **Stomach Ulcers** *and* **Gastritis**

Helicobacter pylori (H. pylori) is a major cause of gastritis and ulcers.[1-7]

The two scientists who discovered this were awarded the **Nobel Prize** in Physiology or Medicine.[8]

Infection with the ***H. pylori*** bacteria is often *without* symptoms.[1]

[1]***H. pylori*** affects almost **50%** of the population.[5,9] It boosts the risk of **stomach cancer**[10] by **two- to six-fold**,[1] and can cause gastritis and peptic ulcer disease.[11-14]

Standard treatment for *H. pylori* involves a powerful antibiotic combination,[15] but antibiotic resistance has reduced overall efficacy.[16,17]

Japanese researchers have developed a combination of **zinc** and **carnosine** that **removes** *H. pylori* while **healing** the damage it has caused.

A specific **probiotic** strain called ***Lactobacillus reuteri DSMZ 17648*** has also been shown to reduce *H. pylori* bacteria.

This non-drug approach can safely inhibit ***H. pylori***, heal the stomach lining, lower inflammation, and alleviate chronic stomach problems.

The Gastrointestinal Domino Effect

The **acidity** of the stomach is beneficial because it acts as a primary defense against infection and assists in the early stages of digestion.

The body protects its own delicate tissues from harsh stomach acid with systems that require precise balance.

The first defense mechanism is specialized surface cells in the stomach's lining that secrete a heavy coating of protective mucus. Second, a rapid cell-turnover in the lining itself keeps fresh cells always at the ready.

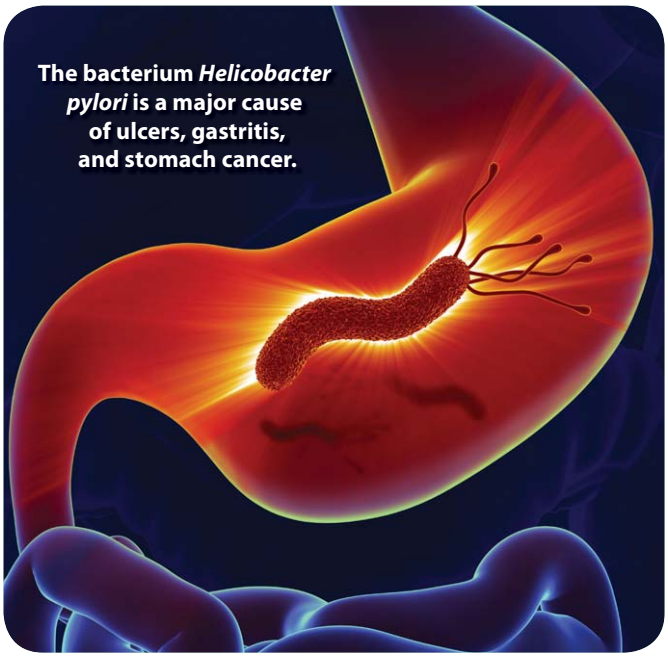
If the body's natural defenses against stomach acids become disrupted, it can result in stomach disorders such as painful **gastritis** and **peptic ulcer disease**.[11-14]

Gastritis is inflammation of the stomach lining. It doesn't always produce symptoms, but when symptoms do arise they can include abdominal pain, nausea, vomiting, and indigestion.[11] Such symptoms are generally written off as an annoyance. In reality, these episodes leave *lasting* damage that eventually leads to mucosal damage and inflammation.[11-13]

While this process can be triggered by a host of factors, one of the most common causes is infection with the ***H. pylori*** bacterium.

H. pylori: A Major Threat to Your Stomach's Defenses

H. pylori is a major cause of stomach and upper intestinal disorders, including **ulcers** of the stomach and duodenum (the beginning of the small intestine), **gastritis**, and **stomach cancer**.[18,19]



Over time, *H. pylori* erodes the essential **mucosal barrier**, leaving delicate tissue in the stomach and small intestine exposed to harsh acids that cause distress ranging from gastritis to cancer.[2,11,20]

Once imbedded in the mucous lining, this bacterium produces an influx of inflammatory cells by secreting powerful "virulence factors."[18] These bacterial proteins block normal function of certain immune cells, while boosting the free radical production,[21,22] and stimulating still another group of immune cells to produce inflammatory cytokines, the messengers that call new inflammatory cells into the region.[18]

H. pylori can be effectively treated with antibiotics. However, there is compelling evidence that the unique combination of the mineral **zinc** with the amino acid-derived **carnosine** peptide provides effective actions against *H. pylori* and safely restores stomach health.[23,24]

Zinc-Carnosine's Potent Gastric Protection

Supplementation with **zinc** has long been shown to provide gastroprotective effects.[25,26]

The nutrient carnosine can boost these effects even further.

In an exciting development, Japanese researchers developed a zinc-carnosine compound that provides gastric protection beyond that of either nutrient alone.

This **zinc-carnosine** compound—comprising zinc and carnosine—is sold as a prescription anti-ulcer drug in Japan.[24,27] It's also available in the United States as a non-prescription **dietary supplement**.

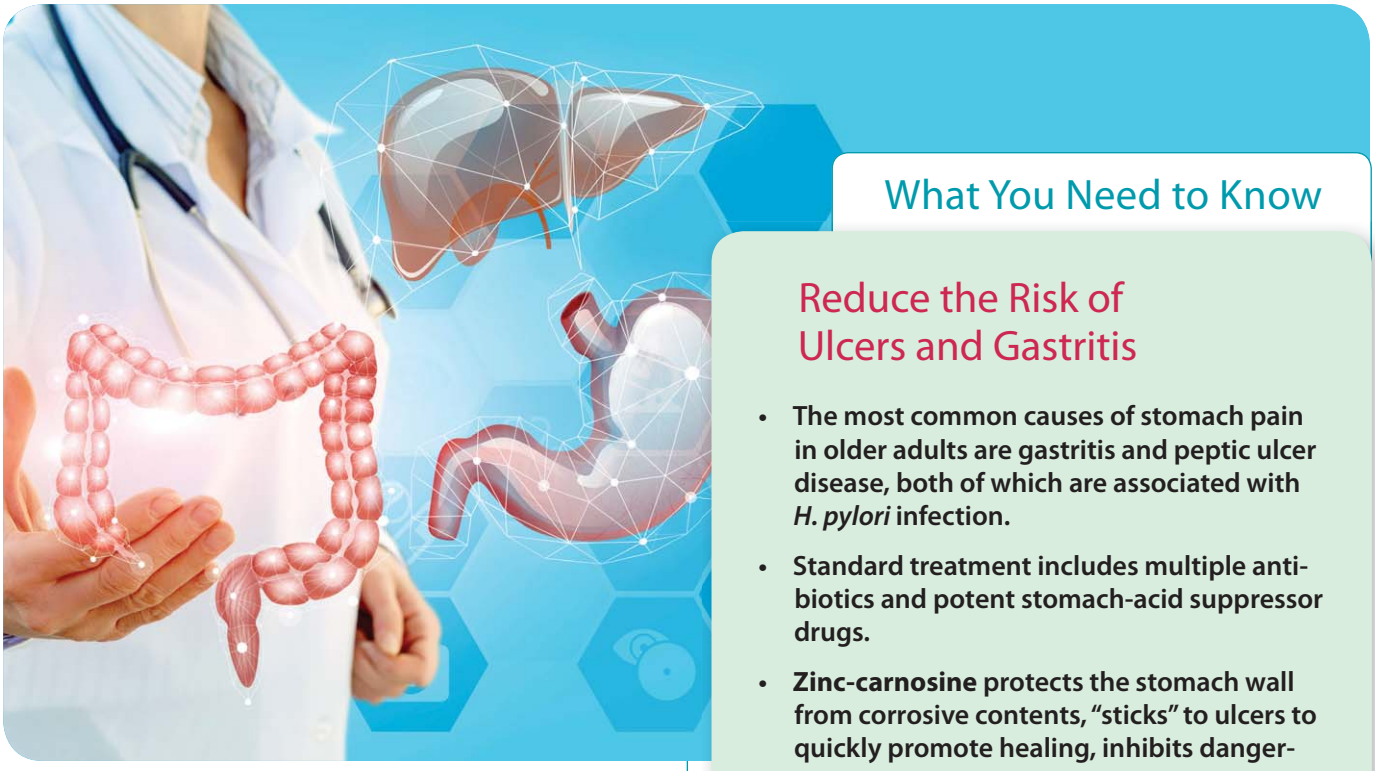
Because of its unique mechanisms, **zinc-carnosine** gets delivered directly to the stomach wall, where it *sticks* to the wall much more tightly than either zinc or carnosine alone. This allows the beneficial effects of both components to be delivered directly to the site where protection is most needed.[24,28]

Zinc-carnosine offers a **comprehensive** approach to addressing stomach issues such as gastritis and peptic ulcers. For starters, it eliminates the **source** of the problem by accelerating the eradication of *H. pylori* itself.[29,30] It's also been shown to neutralize free radicals[31,32] and reduce inflammation.[33]

In addition to boosting the production of a growth factor important for **gastric wound repair**,[34,35] zinc-carnosine also repairs the damaged mucous lining, which stimulates secretion of mucus and further promotes healing.[31,36]

Zinc-carnosine also inhibits stomach **inflammation** caused by *H. pylori* infection, a protective action that helps break the infection-inflammation-cancer chain.[30]

These protective actions have been borne out in animal and human studies.



What You Need to Know

Reduce the Risk of Ulcers and Gastritis

- **The most common causes of stomach pain in older adults are gastritis and peptic ulcer disease, both of which are associated with *H. pylori* infection.**
- **Standard treatment includes multiple antibiotics and potent stomach-acid suppressor drugs.**
- **Zinc-carnosine protects the stomach wall from corrosive contents, "sticks" to ulcers to quickly promote healing, inhibits dangerous *H. pylori*, and treats gut permeability.**
- ***Lactobacillus reuteri* strain DSMZ 17648 binds to *H. pylori*, carrying them out of the body, which reduces the load of infection and helps prevent stomach cancer.**
- **Together, these treatments relieve stomach pain related to gastritis and peptic ulcer disease, promote healing in the stomach, and prevent gastric cancers related to *H. pylori*.**

Animal Studies

Giving animals zinc-carnosine can prevent—*or rapidly* ***heal***—ulcers.[36-40]

Studies show that it protects the stomach mucosa by inducing an *enzyme* involved in reducing inflammation and quelling free radicals. It also protects cells through an increase in the level of (protective) heat shock proteins.[41-44]

In another animal study, scientists tested the effects of zinc-carnosine on animal models of stomach damage and small-intestine damage. In each case, cells were damaged by stress or by a potent NSAID (nonsteroidal anti-inflammatory drug) called *indomethacin*.

Zinc-carnosine reduced stomach injury by **75%** and reduced small-intestine injury by **50%**. It also stimulated migration and proliferation of cells at and near the injury sites by almost **three-fold**.[45]

Based on the successful animal studies, researchers then turned to human studies to verify this compound's clinical effects.

Validating Zinc-Carnosine in Human Studies

Human studies show that **zinc-carnosine** is effective at reducing the symptoms associated with ulcers, while also promoting healing of the damaged area.

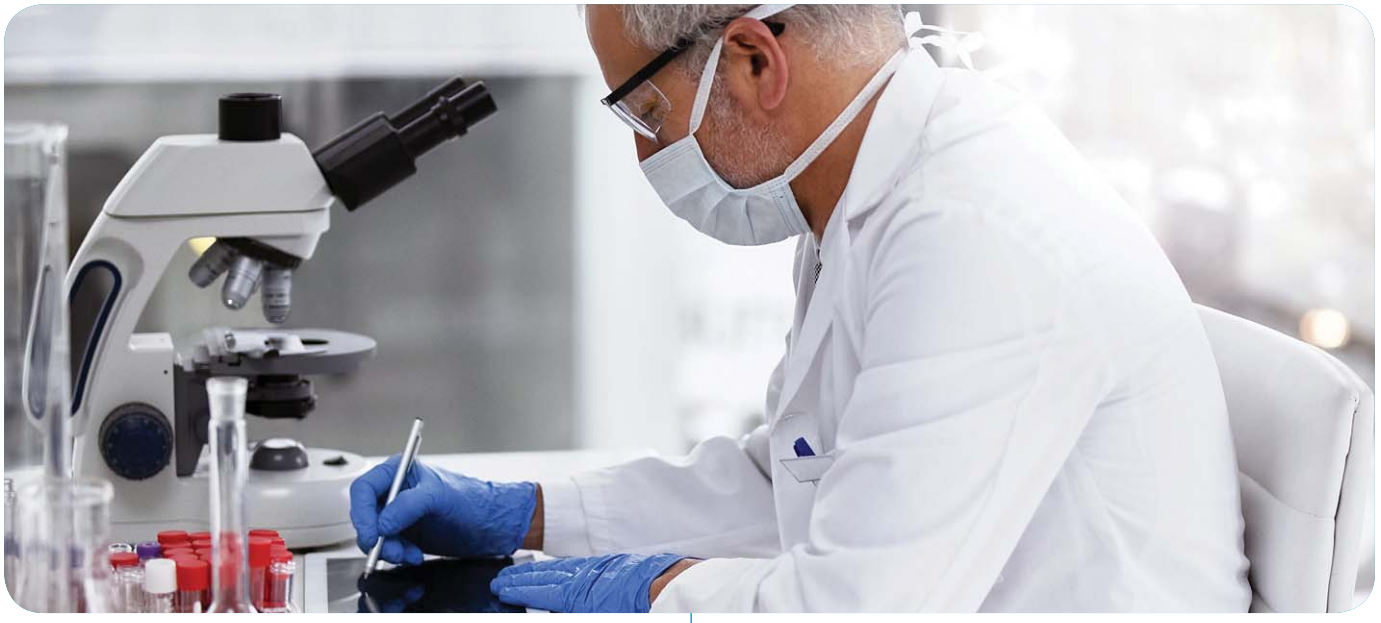
Scientists gave **150 mg** of zinc-carnosine per day to 25 patients diagnosed with gastric ulcers.

After eight weeks, they documented a:[46]

- **63.6%** reduction in heartburn,
- **80%** reduction in belching,
- **66.7%** reduction in nausea,
- **76.9%** reduction in abdominal distention, and
- **71%** reduction in stomach tenderness.

The researchers also reported:[46]

- Complete disappearance of nighttime pain in **91%** of participants, and
- **Healing** in **65%** of subjects during endoscopic assessment.



Outperforms Standard Treatments

In a double-blind study, researchers conducted a head-to-head comparison of **zinc-carnosine** (**150 mg**) and *cetraxate* (a drug commonly used to treat ulcers) in patients with gastric ulcers. In the group taking zinc-carnosine, **60.4%** had ulcer **healing** that was confirmed by endoscopy, compared with just **46.2%** of the drug recipients.[47]

Once again, this study confirms the ability of **zinc-carnosine** to **heal** the damage caused by ulcers.

A third human trial set out to determine zinc-carnosine's impact on *H. pylori* status. For this study, 66 patients with proven *H. pylori* infections were given the most common three-drug therapy: two antibiotics plus the proton pump inhibitor *lansoprazole* (Prevacid®). Half of those patients also received **300 mg** of zinc-carnosine daily.

In the subjects taking the drug combination (without the addition of zinc-carnosine), *H. pylori* was eradicated in **86%**. But in subjects also taking zinc-carnosine, *H. pylori* was eradicated in **100%** of subjects—in just seven days![29]

Gut Permeability

Next, scientists looked beyond stomach protection to see what effects zinc-carnosine might have on **gut permeability**.

There is a critical barrier between the gut and the rest of the body. It serves a dual purpose of allowing nutrients to pass through the gut, while also keeping harmful substances from spreading through the body.

Stresses such as prolonged strenuous exercise, heat stress, and NSAIDs can damage gut-barrier integrity.[48]

Research shows that **zinc-carnosine** can help protect against increased gut permeability caused by **NSAIDs** and **exercise**.

In one clinical trial, 10 healthy volunteers took **150 mg** a day of the NSAID drug *indomethacin* with either a placebo or with zinc-carnosine.[45]

- Taking indomethacin alone increased (worsened) gut permeability by a factor of **three**.
- In the group taking the NSAID along with **zinc-carnosine**, there was **no** significant increase in permeability.

The researchers concluded that zinc-carnosine **stabilized** the cells of the mucosal lining of both the stomach and small intestine, suggesting potent gastroprotective effects.[45]

In another trial, scientists tested zinc-carnosine's effects on gut permeability in athletes. In a double-blind, placebo-controlled crossover protocol, two arms included eight athletes who took a placebo or zinc-carnosine, for 14 days.[48]

- In subjects taking the placebo, exercising 14 days after the start of the treatment resulted in a **three-fold** *increase* (worsening) in gut permeability.
- But in the zinc-carnosine group, exercising 14 days after the start of treatment prevented the increase (worsening) in gut permeability by **70%**.

Researchers found that zinc-carnosine had increased epithelial resistance and improved the structure of "tight junctions"—a network of sealing strands that play a role in barrier permeability.[48]

In all, this unique **zinc-carnosine** compound provides protective gastrointestinal effects by directly combatting *H. pylori*, protecting the vulnerable stomach lining, quelling inflammation caused by gastritis and peptic ulcer disease, and ultimately helping prevent stomach cancer.

Readers should be cautioned that NSAID drugs taken over a prolonged period can cause organ damage beyond the stomach lining. For example:

- Current users of **ibuprofen** (for 1-7 days) have **1.48-fold** greater odds of suffering a heart attack,[49]
- Current users of **naproxen** (Aleve®) (for 1-7 days) have **1.53-fold** greater odds of suffering a heart attack,[49]
- Regularly taking **NSAID** drugs (such as ibuprofen) increases the risk of kidney impairment by **32%.**[50]

So zinc-carnosine should not be thought of as a systemic protector against chronic use of NSAID drugs like ibuprofen and naproxen.

While **zinc-carnosine** protects the **stomach** against common over-the-counter pain relievers like ibuprofen, the **kidneys** and the **heart** are still vulnerable to the toxic side effects of these drugs.

Lactobacillus reuteri Eradicates *H. pylori*

For additional stomach protection, a strain of beneficial bacteria can be a useful addition to zinc-carnosine because of its capacity to remove *H. pylori* from the body.

After investigating about 700 strains of *Lactobacillus* species, scientists identified one that has the ability to bind to *H. pylori* organisms and carry them harmlessly out of the gastrointestinal tract.

Doing so substantially decreases the number of *H. pylori* bacteria residing in the stomach—without antibiotics and their risks.[51] This unique form of heat-treated bacteria is known as ***Lactobacillus reuteri* strain DSMZ 17648**.

Two human studies were conducted to determine the effect of *Lactobacillus reuteri* strain DSMZ 17648 on *H. pylori*.[51,52] Each used a **urea breath test** that indicates whether *H. pylori* is present in the stomach. This test detects a product of *H. pylori* metabolism in the subject's breath.

Volunteers took either two tablets of *Lactobacillus reuteri* strain DSMZ 17648 or a placebo twice daily for two weeks. In both studies, there was a significant reduction in the number of *H. pylori* in the stomachs of those taking the probiotic, while the placebo had no effect.[51,52]

Despite having documented *H. pylori* infections, none of these individuals had any symptoms. Since *H. pylori* is known to contribute to stomach cancer even in patients *without symptoms*,[9,53] the ability of the *Lactobacillus reuteri* strain DSMZ 17648 to reduce *H. pylori* makes these studies important.

Summary

Prescription drugs, fast food, alcohol, and chronic stress can all trigger gastric distress, leading eventually to serious damage to delicate stomach tissue.

A key culprit in this scenario is ***H. pylori***. This ulcer-inducing bacterium affects almost **50%** of the population and boosts the risk of stomach cancer by **two- to six-fold**.

Zinc-carnosine protects the stomach wall, reduces inflammation, decreases *H. pylori* numbers, and improves gut permeability.

The probiotic ***Lactobacillus reuteri* strain DSMZ 17648** dramatically reduces *H. pylori* populations.

Zinc-carnosine and this ***L. reuteri*** strain can be expected to relieve stomach discomfort related to gastritis and peptic ulcer disease, promote natural healing, and help reduce risk factors involved in gastric cancers related to *H. pylori*.

Zinc-carnosine plus this specific **probiotic** can be used in conjunction with antibiotic therapy to eradicate *H.pylori*. Patients currently taking antibiotics should not stop taking them unless so advised by a physician. ●

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

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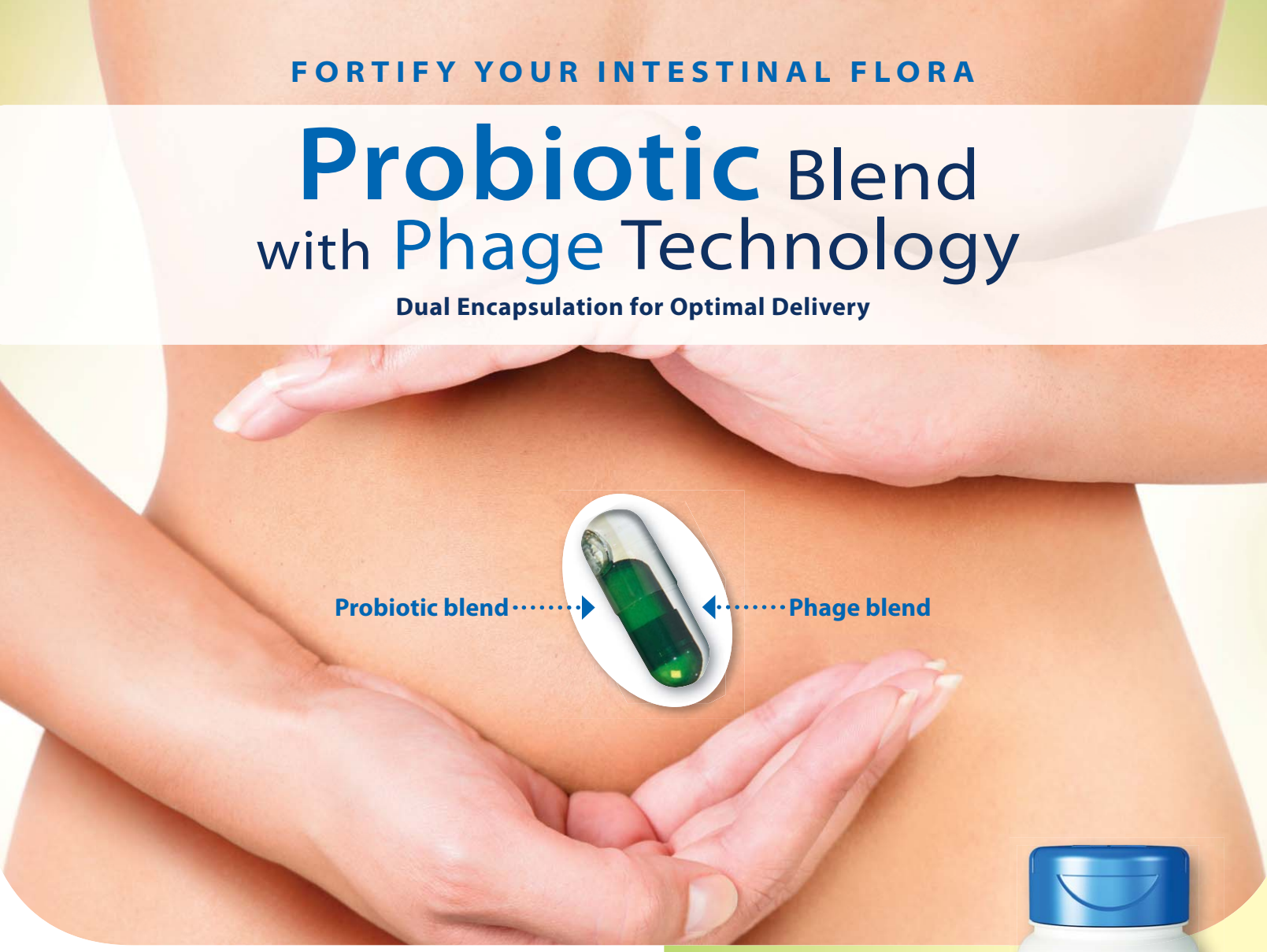

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Pecans

BY GARRY MESSICK

The pecan—actually a seed rather than a nut—is a popular snack, often used as an ingredient in desserts such as praline candy and pecan pie. But leave those unhealthy, sugary treats aside and the unadorned pecan stands on its own as a food with a number of notable health benefits.

Cholesterol

There's evidence pecans, with their monounsaturated fatty acids, can beneficially affect lipid profiles by lowering triglycerides and LDL ("bad") cholesterol while raising HDL ("good") cholesterol.[1]

Gallstones

Research has found a link between frequent nut consumption (including pecans) and lower risk of gallstones in men.[2] Further research is needed to understand the mechanism behind this effect, although it may have something to do with the fact that most gallstones in Western countries are cholesterol stones, and pecans and other nuts have a beneficial effect on blood cholesterol.

Cardiovascular Disease

Pecans may help protect against heart disease due to their richness in compounds such as tocopherols, which help inhibit oxidation of LDL cholesterol.[3] Elevated levels of oxidized LDL are associated with atherosclerosis.

Diabetes

A study found that consumption of pecans and other nuts may help reduce the risk of type II diabetes in women.[4] The study authors suggested substituting nuts for refined grains or red meats as a healthy way to add them to one's diet without raising one's overall caloric intake.

Cardiometabolic Risk

A randomized, controlled feeding trial of overweight adults found that a diet rich in pecans improved serum insulin, insulin resistance, and beta cell function compared to a diet that was similar in fat and fiber content but did not include the tasty nuts.[5]

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THE LONGEVITY CODE

BY KRIS VERBURGH, MD

For millennia, humankind has thought of aging as an inevitable process. After all, what could be more observably apparent than that everyone who survives past a certain age begins to slowly deteriorate, ends up decrepit, and dies?

But the latest science tells us that aging is essentially a disease, and, like any other disease, it can possibly be cured.

In his new book, *The Longevity Code: Secrets to Living Well for Longer from the Front Lines of Science*, medical doctor and researcher Kris Verburgh examines the reasons why we age and what can be done to not just slow that process, but even reverse it through various means including scientific breakthroughs that currently exist or are very close to being realized.

Dr. Verburgh is a researcher at the Center Leo Apostel for Interdisciplinary Studies at the Free University Brussels and is on the faculty of Singularity University, a Silicon Valley think tank. He has proposed the discipline of nutrigerontology to develop diets and guidelines to reduce the risk of age-related diseases.

In the following interview, Verburgh discusses the reasons aging exists and briefly touches on aspects of his four-step plan to slow and even reverse it.

— Garry Messick

LE: What is the cause of aging?

KV: The average lifespan of an animal species, or the rate at which it ages, is determined by the average time that this animal species can survive in the wild. If an animal species, such as a mouse, frequently dies of external causes, it will also age faster and have a shorter lifespan. If an animal species can survive longer in the wild, it will age at a slower rate and have a longer lifespan, as is the case with turtles. That explains why a mouse is already very old at age 3, while a bat can live to be 30 years old.

In contrast to mice, bats can fly, which is why they can evade danger much faster. Unlike mice, they do not have to live on the ground, where they can fall prey to cats and mouse traps. Thanks to their wings, bats can also cover longer distances and are better able to find food. Every mutation in the past that made it possible for a bat to live longer was useful, because bats are much better able than mice to flee from danger, find food, and survive.

What is true for mice is also true for people. Our lifespan, too, is determined by the length of time that our ancestors could overcome dangers and survive in the wild. In prehistoric times humans often perished by around age 30 from disease, hunger, accidents or violence. A mutation that allowed them to age at a slower rate and live longer (to 200 years, for example) was not useful, because before their third decade they usually had been eaten by a saber-toothed tiger or died from blood poisoning caused by a tooth abscess.

LE: So aging isn't a simple matter of wear and tear, as was once thought?

KV: The popular notion that aging is a matter of irreparable damage stems from the so-called machine myth. People tend to view the human body or any other organism as a machine that is subject to wear and tear and eventually breaks down. But living beings are not machines. Contrary to machines, living beings can continuously rejuvenate and repair themselves. They do that by extracting energy from their environment (in the form of nutrients, light, and oxygen).

LE: So what can we do to slow down the aging process?

KV: Scientists have learned a lot more about aging in the last decade than in the thousands of years before. New discoveries follow each other with unprecedented speed. To better organize these new insights and knowledge, and to make maximum use of their potential, I have designed a plan for living a longer and healthier life. It can be represented in the form of a staircase, which currently has four steps. Each step contains a method to slow down the aging process and stay young longer.

LE: What's the first step?

KV: Avoid deficiencies. In the West, millions of people are overweight but still suffer from malnutrition. They consume too many macronutrients, and are malnourished due to a lack of micronutrients. Macronutrients are carbohydrates (sugar), fats, and proteins. These foods supply energy. Micronutrients are healthy substances, such as vitamins, flavonoids, stilbenes, phenolic acids, lignans, and omega-3 fatty acids. Micronutrients are needed for the proper functioning of the body. Much of the food we eat today consists mainly of macronutrients with very few micronutrients.

LE: Can you give an example of an important, neglected micronutrient?

KV: Magnesium is a micronutrient that is lacking in many people. Magnesium binds to all kinds of proteins to make them function better. Like the B vitamins, this mineral is important for our metabolism, including sugar metabolism. Magnesium improves the ability to process sugars. That is important because the older we get, the

less the body is able to process sugars, which increases our risk of various aging-related diseases, including type II diabetes, cardiovascular disease, and dementia. Magnesium can also lower blood pressure, which is good for the blood vessels. It can also reduce the risk of heart-rhythm abnormalities, which are an important cause of death in older people.

LE: You write in your book that supplements can be useful, and that studies sometimes erroneously find that certain supplements are not beneficial because they either use too low a dose, or the wrong form of a vitamin, or they ignore the ways vitamins and nutrients work together. Can you give an example of how researchers make these mistakes?

KV: One study found that in people with little vitamin B12 in their blood, there can be six times greater shrinkage of the brain than in people with sufficient vitamin B12. Researchers who gave high doses of vitamins B6, folic acid (B9), and vitamin B12 to a group of elderly people observed in brain scans that there was seven times less brain shrinkage in this group than in a group that did not take supplements. The researchers concluded that "the disease process responsible for cognitive decline can be slowed down significantly and maybe even halted."

A more recent study, however, in which participants were given high doses of only two types of B vitamins (B9 and B12) did not show an effect on cognition. Does that mean that high doses of B are useless? Not according to scientists like Sudha Seshadri, a professor and Alzheimer's researcher, who stated, "The second study did not last long enough and the methods used to measure cognition were too crude." The study lasted two years, while we know that diseases like Alzheimer's take decades to develop. Also, only two types of B vitamins were used, while there exist many other B vitamins, which all have a synergistic effect in our body by working together.

LE: Your second step to combat aging is to stimulate hormesis—the effect by which harmful things can be healthy in small doses. You mention the highly beneficial drug metformin as an example.

KV: Metformin, as it happens, is mildly toxic to mitochondria, the energy generators that activate the cells in our body. This causes the mitochondria to better protect and repair themselves, making them less prone to aging. This, in turn, causes the body to improve its capacity to process insulin and sugars.

Exercise is also a form of hormesis. The most important reason why exercising is healthy is because it damages the body. An hour of cycling or swimming makes our cells work much harder than they usually do. They become overtaxed and slightly damaged, which you can feel the next day when you wake up with sore muscles. However, this prompts cells to repair and protect themselves for the next time you go for a bike ride or dive into a pool. As the cells keep arming themselves against that kind of damage, they are then also better prepared against other kinds of damage, such as that caused by aging processes. This is one important reason why exercising can decrease the risk of all kinds of aging-related diseases, such as heart disease and dementia.

LE: After your third step of reducing growth stimulation that speeds up cell aging, your fourth step for longevity is to not just slow but reverse the aging process. We don't have space to discuss all the possibilities you mention in your book, but could you briefly outline one of the more interesting scientific advances in this area, the use of CRISPR proteins?

KV: CRISPR proteins are a recent discovery that enables researchers to rewrite genes (pieces of DNA that contain the building instructions for proteins).

Until recently this was a very laborious and time-consuming process. A certain gene had to be made in the laboratory (a piece of DNA that could cure a disease caused by absence of that gene or a poorly functioning gene). This gene had to be inserted into a virus and that virus was injected into a person. The virus then infected cells and planted the gene somewhere at random in your DNA. Since this is a completely random process it could, for example, cause cancer if the gene was planted in an area of DNA that controls cell growth.

Via CRISPR proteins, this can all be done very fast and very precisely. They are designed to search out and rewrite specific genes in the DNA. Scientists have succeeded in curing mice of a metabolic disease simply by injecting CRISPR proteins into the tail. These proteins rewrote the DNA of the mice so that they no longer suffered from this genetic disease.

LE: How does CRISPR technology relate to the fight against aging?

KV: In the future, it may be possible to rewrite genes that play a role in aging. Some people may object that this would be very difficult, since they believe that many thousands of genes are involved in the aging process, and it would be difficult to change all these genes. But that does not seem to be necessary. Often only one gene needs to be changed to extend the lifespan, as has been shown in numerous experiments with lab animals. Changing only one gene, such as the gene that controls insulin metabolism, could allow a mouse to live, for instance, **50%** longer. These genes are often master genes that can influence the activity of other genes. You would need to change only these master genes.

Besides altering the genome with technologies like CRISPR, there also seems to be promise in modifying the epigenome. The epigenome determines which genes are active or not. Scientists managed to reprogram the epigenome in mice, thereby rejuvenating them. The grey fur of the mice turned shiny black again, and their organs and muscles could regenerate themselves far better. Many other fascinating experiments show that aging can be reversed, at least in animals.

LE: To sum up, what should the average person do to achieve longevity?

KV: In the future, we will see the advent of promising new technologies that can substantially slow down, or even reverse aging. However, the best method we currently have to live as long as possible is our lifestyle. It is not a coincidence that a healthy lifestyle reduces the risk of both age-related diseases and overweight, for aging and overweight are two sides of the same coin. And for those who want to become really old, a healthy lifestyle is the best way to achieve it. They may be able to profit from LEV, longevity escape velocity, to achieve a much longer life. Each time, they will live long enough to profit from the latest life-extending technology. To put it in the words of Bill Maris, the former Google investing maverick, "I just hope to live long enough not to die." ●

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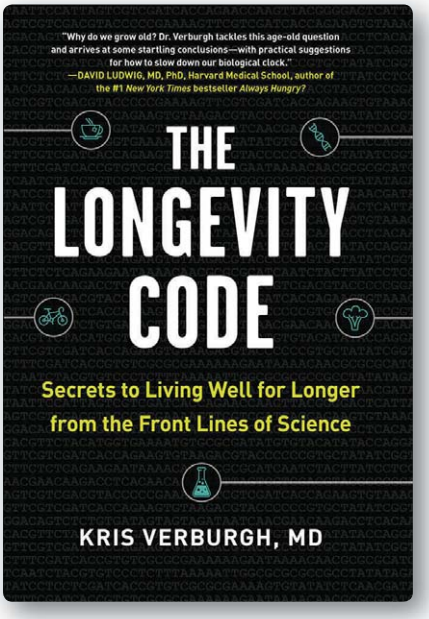

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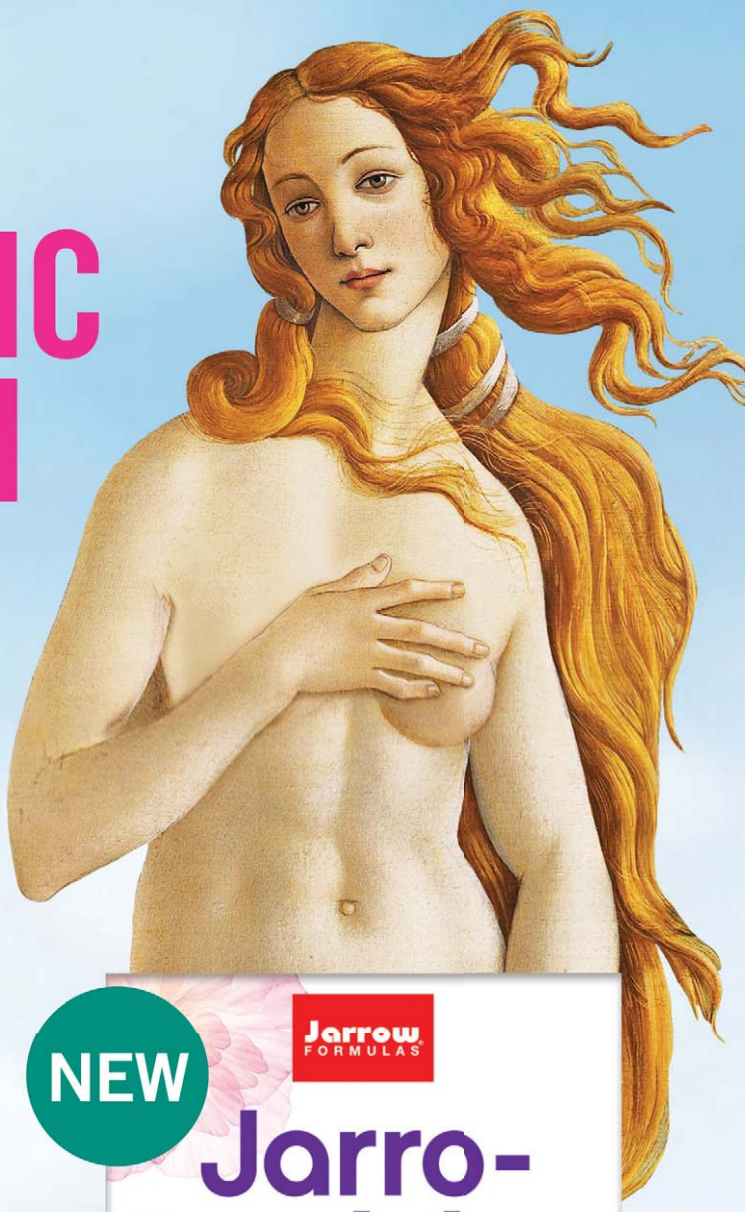

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Japan the Cookbook

by Nancy Singleton Hachisu

Author Nancy Singleton Hachisu says that when she decided to write a comprehensive cookbook of Japanese cuisine, she didn't know what she was getting herself into. The project ended up requiring three years of intensive work and involved input from chefs and ordinary people from regions throughout the island nation.

But the results were so gratifying, Hachisu says she would have taken up the project even if she *had* known the amount of hard work that lay ahead. She describes the final product as "impressive in its contribution," due to the collective effort from various Japanese artisans and cooks, as well as the photographers and the publisher, in creating a cookbook that is as rich in content as it is beautifully bound and illustrated.

"I feel less like the author and more like the conduit, for sharing this moment in time of Japanese food," says Hachisu.

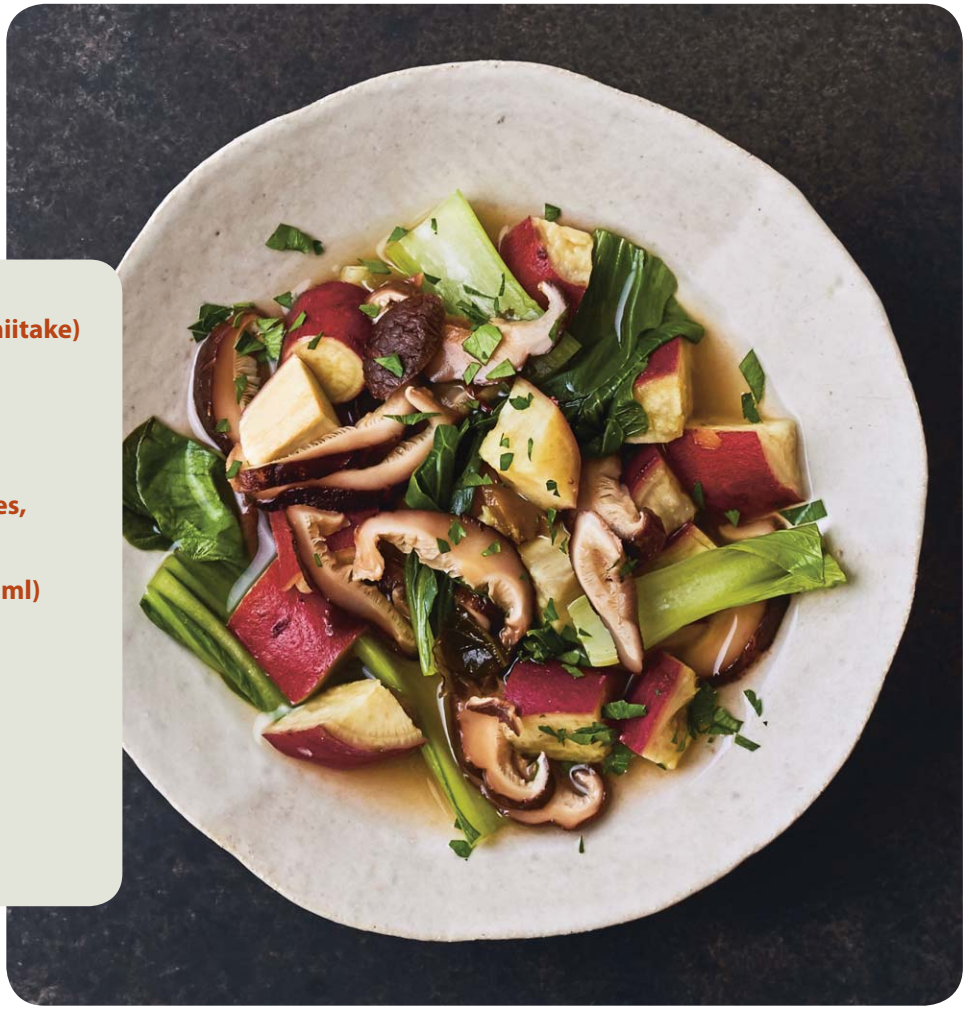
Although originally from the U.S., Hachisu traveled to Japan in 1988 intending to learn Japanese for a year and then return home for graduate school. Instead, she ended up falling for and marrying a Japanese organic farmer and his lived with him in his farmhouse for the last 30 years, along with their three sons. She has taught home cooking to Japanese housewives, is the author of several internationally acclaimed cookbooks, and is well-known and respected in Japan as an authority on the nation's cuisine.

Many Japanese dishes are based on healthy ingredients, including a large variety of vegetables. Below, we've reprinted three delicious examples of this from *Japan the Cookbook*.

—Garry Messick

SIMMERED SHIITAKE AND SWEET POTATO

Preparation time: 45 minutes • Cooking time: 10 minutes • Serves: 6



- **6 donko (thick-capped dried shiitake)**
- **Boiling water**
- **5 ¼ oz. (150 g) head bok choy, pulled in half lengthwise**
- **1 lb. 5 oz. (600 g) sweet potatoes, well-scrubbed but not peeled**
- **Generous 2 cups (17 fl. oz./500 ml) chicken stock**
- **1 teaspoon salt**
- **1 tablespoon finely slivered cha tsai (mustard stems)**
- **2 tablespoons chopped Italian or curly parsley**

This dish has an interesting and delicious combination of flavors.

Sweet potatoes are a good foil for earthy *shiitake*, while the chicken stock gives the dish depth and the pickled *cha tsai* (mustard stems) lend pop.

Soak the *shiitake* in 1 cup (8 fl. oz./250 ml) boiling water for 30 minutes.

Meanwhile, slice the torn bok choy in half crosswise where the leaves meet the stems. Cut the sweet potato into ¾-inch (2 cm) pieces.

Reserving the soaking liquid, drain the *shiitake*, pare off the stems and discard. Slice the caps into ¼-inch (6 mm) pieces. In a medium pot, combine the chicken stock and the soaking liquid. Slide in the *shiitake*, bok choy stems, and sweet potatoes with the salt and *cha tsai*. Bring to a lively simmer over medium high heat and cook until the sweet potatoes have softened, about 7 minutes. Stir in the bok choy leaves and cook until they are wilted, 1–2 more minutes. Spoon into a pretty serving bowl and garnish with chopped parsley.

ASPARAGUS WITH SESAME-VINEGAR DRESSING

Preparation time: 25 minutes • Cooking time: 10 minutes • Serves: 6

- **1 lb. 5 oz. (600 g) asparagus**
- **1 tablespoon canola (rapeseed) oil**
- **2 teaspoons gold sesame seeds**
- **2 teaspoons black sesame seeds**
- **2 teaspoons white sesame seeds**
- **3 tablespoons brown rice vinegar**
- **3 tablespoons mirin**
- **1 teaspoon soy sauce**
- **1 pinch of flaky sea salt**

A trio of sesame seeds brightens up asparagus with its subtle flavor and pretty combination of colors.

Bring a large pot of water to a boil over high heat. Snap the bottoms off of the asparagus where they naturally want to break. Blanch until crisp-tender, 2–5 minutes depending on the thickness. Refresh under cold, running water. Pat dry in a clean tea towel. Cut on the diagonal into ¾-inch (2 cm) pieces.

In a small frying pan, heat the oil over medium-low heat. Add the sesame seeds when you can feel some heat rising from the pan. Cook, stirring until you can smell the aroma of sesame, about 1 minute. Scrape into a small bowl to cool.

Toss the asparagus pieces with the cooled sesame seeds, vinegar, *mirin*, soy sauce, and salt. Serve at room temperature, or cold the next day as a salad or vegetable side dish.

SARDINES WITH CARROT-TOMATO SAUCE

Preparation time: 25 minutes, plus 30 minutes salting time • Cooking time: 25 minutes • Serves: 6

- **3 large fresh sardines (1 lb./450 g)**
- **½ teaspoon fine sea salt**
- **3 tablespoons (45 g) unsalted butter**
- **1 medium onion, diced**
- **3 piman or small green peppers, diced**
- **2 medium tomatoes, diced**
- **1 medium carrot, diced**
- **3 small garlic cloves, finely diced**
- **⅔ cup (5 fl. oz./150 ml) chicken stock**
- **½ lemon**
- **1 small handful coarsely chopped parsley (Italian or curly)**

Italian in feel, this dish remains Japanese in conception. It is delicious with Japanese rice or baguette toasts.

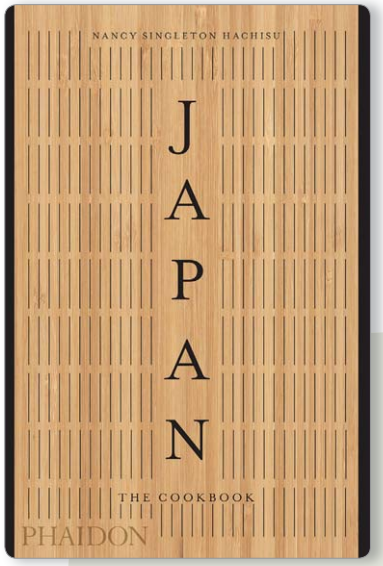
Slice the heads off of the sardines and cut down the belly with a sharp knife. Pull out the guts, vertebrae, and tail and discard. You will have 6 fillets. Rinse under cold running water and pat dry. Lay out on a dinner plate and, holding your hand 12 inches (30 cm) above the fish (to ensure a light even coating), salt on all sides with the salt. Let sit for 30 minutes, refrigerated.

Heat a large, heavy frying pan over medium heat and drop in the butter when you can feel the heat rising from the surface of the pan. Swirl the butter around the pan briefly, then immediately lay the fillets in the pan, skin-side down. Adjust the heat to medium-low and cook until golden brown and the flesh has cooked through, 1½ minutes on each side. Remove the fillets to a clean serving platter to rest.

Add the onion, piman, tomatoes, carrot, and garlic to the pan and cook, stirring, over medium-low heat for about 3 minutes. Stir the chicken stock into the vegetables, bring the liquid to a quick boil, adjust the heat to medium-high to maintain a lively simmer, and cook until the carrots are soft and the excess liquid has evaporated, about 5 minutes.

Spoon the carrot-tomato sauce on top of each sautéed sardine, squeeze the lemon over, and strew with parsley before serving. Serve hot or at room temperature.

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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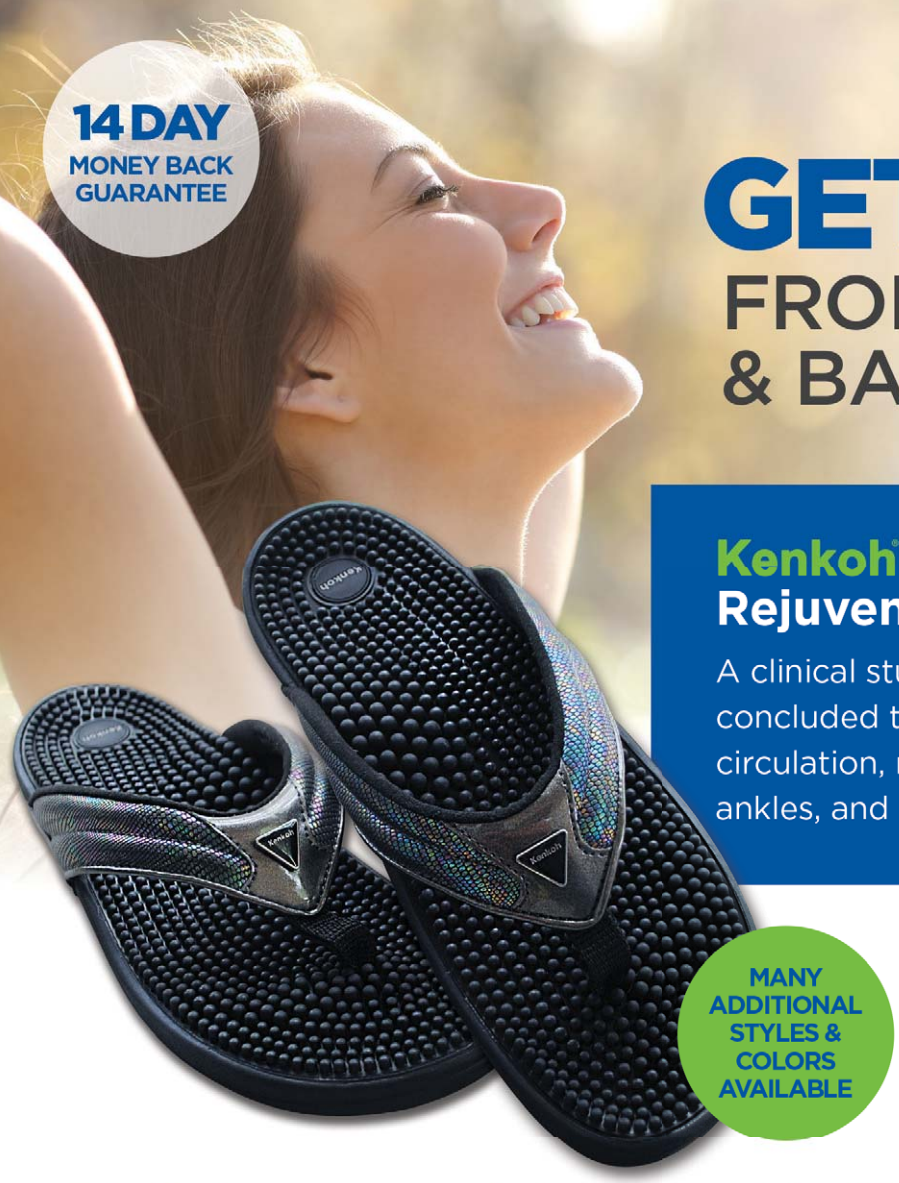
Reprinted from *Japan the Cookbook* (Phaidon 2018) by Nancy Singleton Hachisu
Photos: Jennifer May



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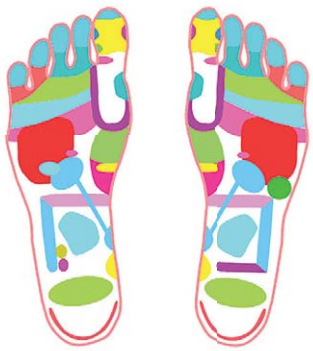

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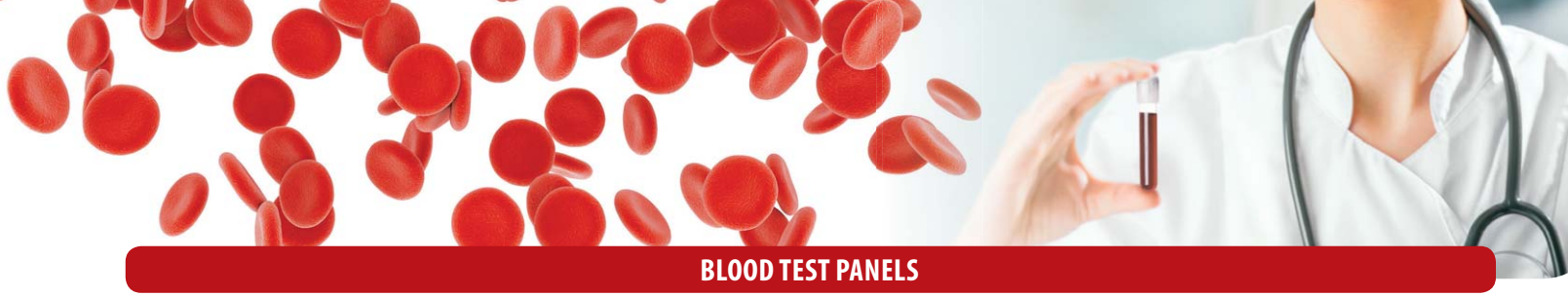

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Life Extension Mix™ Powder
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Skin Care Collection Night Cream
Skin Firming Complex
Skin Lightening Serum
Skin Restoring Ceramides
Skin Stem Cell Serum
Skin Tone Equalizer
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Tightening & Firming Neck Cream
Triple-Action Vitamin C Cream
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Ultra Rejuvenex®
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Vitamin E-ssential Cream
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Melatonin
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Super CLA Blend with Sesame Lignans
Waist-Line Control™

Women's Health

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

ITEM No.	PRODUCT	Retail Each $	YOUR PRICE 1 Unit Each	4 Unit Each	10 Unit Each	QTY	Total
	A						
01524	**ACETYL-L-CARNITINE** • 500 mg, 100 veg. caps	34.00	25.50	22.50			
01974	**ACETYL-L-CARNITINE ARGINATE** • 90 veg. caps	38.00	28.50	26.00			
01628	**ADRENAL ENERGY FORMULA** • 60 veg. caps	24.00	18.00	16.50			
01630	**ADRENAL ENERGY FORMULA** • 120 veg. caps	46.00	34.50	31.50			
01807	**ADVANCED APPETITE SUPPRESS** • 60 veg. caps	38.00	28.50	25.50			
02012	**ADVANCED CORTISOL BALANCE** • 30 veg. caps	45.00	33.75	30.00			
01828	**ADVANCED LIPID CONTROL** • 60 veg. caps	30.00	22.50	20.25			
00681	**AHCC®** • 500 mg, 30 caps	61.98	46.49				
24404	**AHCC® (KINOKO® PLATINUM)** • 750 mg, 60 veg. caps	84.95	63.71				
29727	**AHCC® (KINOKO® GOLD)** • 500 mg, 60 veg. caps	74.95	52.47				
00457	**ALPHA-LIPOIC ACID W/BIOTIN** • 250 mg, 60 caps	37.00	27.75	24.00			
02207	**AMPK METABOLIC ACTIVATOR** • 30 veg. tabs	38.00	28.50	24.00			
01509	**ANTI-ADIPOCYTE FORMULA W/MERATRIM® & INTEGRA LEAN®** (Advanced) • 60 veg. caps	39.00	29.25	27.00			
02140	**ANTI-ALCOHOL W/HEPATOPROTECTION COMPLEX** • 60 caps	22.00	16.50	15.00			
01625	**APPLEWISE** 600 mg, 30 veg. caps	21.00	15.75	14.25			
01039	**ARGININE & ORNITHINE** • 500/250, 100 caps	17.99	13.49				
00038	**ARGININE/ORNITHINE POWDER** • 150 grams	22.95	17.21	14.25			
01624	**(L)-ARGININE CAPS** • 700 mg, 200 veg. caps	26.50	19.88	17.44			
02004	**ARTERIAL PROTECT** • 30 veg. caps	44.00	33.00	29.00			
01617	**ARTHROMAX® W/THEAFLAVINS & APRÈSFLEX®** 120 veg. caps	44.00	33.00	30.00			
01618	**ARTHROMAX® ADVANCED W/UC-II® & APRÈSFLEX®** 60 caps	36.00	27.00	24.00			
02138	**ARTHROMAX® ELITE** • 30 veg. tablets	30.00	22.50	20.00			
01404	**ARTHRO-IMMUNE JOINT SUPPORT** • 60 veg. caps	32.00	24.00	21.00			
01533	**ASCORBYL PALMITATE** • 500 mg, 100 veg. caps	22.50	16.88	15.00			
00888	**ASHWAGANDHA EXTRACT** (Optimized) • 60 veg. caps	10.00	7.50	6.75			
01805	**ASIAN ENERGY BOOST** • 90 veg. caps	24.00	18.00	16.50			
01066	**ASPIRIN** • 81 mg, 300 enteric coated tablets	6.00	4.50	4.00			
01923	**ASTAXANTHIN WITH PHOSPHOLIPIDS** • 4 mg, 30 softgels	16.00	12.00	10.50			
	B						
01945	**B-COMPLEX** (Bio-Active Complete) • 60 veg. caps	12.00	9.00	8.00			
00920	**BENFOTIAMINE W/ THIAMINE** • 100 mg, 120 veg. caps	19.95	14.96	13.95			
00925	**BENFOTIAMINE** (Mega) • 250 mg, 120 veg. caps	30.00	22.50	20.25			
01206	**BERRY COMPLETE** • 30 veg. caps	21.00	15.75	14.00			
01496	**BERRY COMPLETE** (Enhanced) • 60 veg. caps	29.00	21.75	19.50			
00664	**BETA-CAROTENE** • 25,000 IU, 100 softgels	11.75	8.81				
01622	**BIFIDO GI BALANCE** • 60 veg. caps	20.00	15.00	13.50			
01873	**BILBERRY EXTRACT** • 100 mg, 90 veg. caps	36.00	27.00	24.00			
01512	**BIOACTIVE MILK PEPTIDES** • 30 caps	18.00	13.50	12.00			
01631	**BIO-COLLAGEN W/PATENTED UC-II®** • 40 mg, 60 small caps	36.00	27.00	24.00			
††01006	**BIOSIL™** • 5 mg, 30 veg. caps	19.99	15.99				
††01007	**BIOSIL™** • 1 fl oz	31.99	25.59				
00102	**BIOTIN** • 600 mcg, 100 caps	7.50	5.63	4.88			

SUBTOTAL OF COLUMN 1

ITEM No.	PRODUCT	Retail Each $	YOUR PRICE 1 Unit Each	4 Unit Each	10 Unit Each	QTY	Total
01709	**BLACK CUMIN SEED OIL** • 60 softgels	16.00	12.00	10.50			
01710	**BLACK CUMIN SEED OIL W/BIO-CURCUMIN®** • 60 softgels	32.00	24.00	22.50			
01008	**BLAST™** • 600 grams of powder	26.97	20.23				
70000	**BLOOD PRESSURE MONITOR (ACCUFIT™)** • med/lg cuff	79.99	49.99				
70004	**BLOOD PRESSURE MONITOR** • Digital wrist cuff	69.95	52.46				
02024	**BLOOD PRESSURE** (Triple Action AM/PM) • 60 veg. tabs	44.00	33.00	28.00			
01214	**BLUEBERRY EXTRACT** • 60 veg. caps	22.50	16.88	15.00			
01438	**BLUEBERRY EXTRACT W/ POMEGRANATE** • 60 veg. caps	30.00	22.50	20.25			
01506	**BONE FORMULA** (DR. STRUM'S INTENSIVE) • 300 caps	56.00	42.00	37.50			
01726	**BONE RESTORE** • 120 caps	22.00	16.50	14.25			
02123	**BONE RESTORE** • Chocolate, Sugar-Free • 60 chewable tabs	22.00	16.50	14.25			
01727	**BONE RESTORE W/VITAMIN K2** • 120 caps	24.00	18.00	16.50			
01725	**BONE STRENGTH FORMULA W/KOACT®** • 120 caps	45.00	33.75	30.00			
00313	**BONE-UP®** • 240 caps	28.95	21.71	20.41			
01661	**BORON** • 3 mg, 100 veg. caps	5.95	4.46	3.94			
00202	**BOSWELLA** • 100 caps	38.00	28.50	22.50			
00984	**BP MANAGEMENT** (Optimal) • 60 tablets	44.00	33.00	30.00			
01802	**BRAIN SHIELD® GASTRODIN** • 300 mg, 60 veg. caps	33.00	24.75	22.50			
01253	**BRANCHED CHAIN AMINO ACIDS** • 90 caps	19.50	14.63	12.75			
01942	**BREAST HEALTH FORMULA** • 60 caps	34.00	25.50	22.50			
00893	**BRITE EYES III** • 2 vials, 5 ml each	34.00	25.50	24.00			
01203	**BROMELAIN** (Specially-coated) 500 mg, 60 enteric coated tablets	21.00	15.75	14.25			
	C						
01963	**CALCIUM CITRATE W/VITAMIN D** • 200 veg. caps	18.00	13.50	12.50			
01651	**CALCIUM D-GLUCARATE** • 200 mg, 60 veg. caps	18.00	13.50	11.25			
†01823	**CALREDUCE SELECTIVE FAT BINDER** 120 mint chewable tablets	45.00	33.75	28.50			
01700	**CARDIO PEAK™ W/STANDARDIZED HAWTHORN & ARJUNA** 120 veg. caps	36.00	27.00	24.00			
02018	**CARNITINE** (Optimized) • 60 veg. caps	30.00	22.50	20.00			
01532	**L-CARNITINE** • 500 mg, 30 veg. caps	15.00	11.25	9.90			
01829	**CARNOSINE** • 500 mg, 60 veg. caps	36.00	27.00	24.00			
02020	**CARNOSINE** (Super) • 500 mg, 60 veg. caps	40.00	30.00	27.00			
01932	**CAT MIX** • 100 grams powder	14.00	10.50	8.25			
02199	**CHILDREN'S FORMULA LIFE EXTENSION MIX™** 120 chewable tablets	25.00	18.75	17.00			
00550	**CHLORELLA** • 500 mg, 200 tablets	23.98	17.99				
01571	**CHLOROPHYLLIN** • 100 mg, 100 veg. caps	24.00	18.00	15.00			
01359	***CHO-LESS™** • 90 capsules	37.50	37.50				
01910	**CHOL-SUPPORT™** • 60 liquid veg. caps	48.00	36.00	32.00			
01504	**CHROMIUM W/CROMINEX®** 3+ (Optimized) 500 mcg, 60 veg. caps	9.00	6.75	6.00			
01503	**CINSULIN® W/INSEA2® AND CROMINEX® 3+** • 90 veg. caps	38.00	28.50	25.50			
01906	***CISTANCHE*** (Standardized) • 30 veg. caps	20.00	15.00	12.00			
00818	**CLA BLEND W/SESAME LIGNANS** (Super) • 120 softgels	36.00	27.00	24.75	19.75		

SUBTOTAL OF COLUMN 2

ITEM No.	PRODUCT	Retail Each $	YOUR PRICE 1 Unit Each	4 Unit Each	10 Unit Each	QTY	Total
01896	**COGNITEX® W/BRAIN SHIELD®** • 90 softgels	60.00	45.00	39.00	36.00		
01897	**COGNITEX® W/PREGNENOLONE & BRAIN SHIELD®** 90 softgels	62.00	46.50	39.75	37.50		
01421	**COGNITEX® BASICS** • 60 softgels	38.00	28.50	26.25	24.00		
01659	**COGNIZIN® CDP-CHOLINE CAPS** • 250 mg, 60 veg. caps	36.00	27.00	25.50			
02202	**COMFORTMAX™** • 30 day supply	44.00	33.00	29.00			
01945	**COMPLETE B-COMPLEX** (BioActive) • 60 veg. caps	12.00	9.00	8.00			
02298	**COMPREHENSIVE NUTRIENT PACKS ADVANCED** • 30 packs	90.00	67.50	61.50			
01949	**COQ10 W/*d*-LIMONENE** (Super-Absorbable) • 50 mg, 60 softgels	25.00	18.75	16.50	15.00		
01951	**COQ10 W/*d*-LIMONENE** (Super-Absorbable) 100 mg, 60 softgels	30.00	22.50	20.00			
01929	**COQ10** (Super Ubiquinol) • 100 mg, 60 softgels	56.00	42.00	36.00	33.00		
01733	**COQ10 W/PQQ** (Super Ubiquinol) • 100 mg, 30 softgels	50.00	37.50	30.00	27.00		
01437	**COQ10 W/ENH MITOCHONDRIAL SUPPORT™** (Super Ubiquinol) • 100 mg, 30 softgels	33.00	24.75	22.00			
01426	**COQ10 W/ENH MITOCHONDRIAL SUPPORT™** (Super Ubiquinol) • 100 mg, 60 softgels	62.00	46.50	39.00	36.00		
01425	**COQ10 W/ENH MITOCHONDRIAL SUPPORT™** (Super Ubiquinol) • 50 mg, 100 softgels	58.00	43.50	34.50	31.50		
01427	**COQ10 W/ENH MITOCHONDRIAL SUPPORT™** (Super Ubiquinol) • 50 mg, 30 softgels	20.00	15.00	12.00			
01431	**COQ10 W/ENH MITOCHONDRIAL SUPPORT™** (Super Ubiquinol) • 200 mg, 30 softgels	62.00	46.50	39.00	36.00		
00862	**CRAN-MAX®** • 500 mg, 60 veg. caps	17.50	13.13	11.25			
01424	**CRAN-MAX® WITH ELLIROSE™** (Optimized) • 60 veg. caps	18.00	13.50	12.00			
01529	**CREATINE CAPSULES** • 120 veg. caps	10.95	8.21	6.94			
00467	**CURCUMIN®** (Super Bio) • 400 mg, 30 veg. caps	20.00	15.00	14.00			
00407	**CURCUMIN®** (Super Bio) • 400 mg, 60 veg. caps	38.00	28.50	26.25			
01924	**CURCUMIN® W/GINGER & TURMERONES** (Advanced Bio) 30 softgels	30.00	22.50	20.25			
01804	**CYTOKINE SUPPRESS™ W/EGCG** • 30 veg. caps	30.00	22.50	20.25			
	COSMESIS						
80105	**ADULT BLEMISH LOTION** • 1 fl. oz	74.50	55.88	49.17			
80157	**ADVANCED PEPTIDE ANTI-OXIDANT SERUM** • 1 fl. oz	53.00	39.75	34.50			
80165	**ADVANCED GROWTH FACTOR SERUM** • 1 fl. oz	65.00	48.75	42.75			
80170	**ADVANCED HYALURONIC ACID SERUM** • 1 fl. oz	45.00	33.75	29.25			
80154	**ADVANCED LIGHTENING CREAM** • 1 oz	65.00	48.75	42.75			
80155	**ADVANCED PEPTIDE HAND THERAPY** • 4 oz	46.00	34.50	29.25			
80152	**ADVANCED TRIPLE PEPTIDE SERUM** • 1 fl. oz	65.00	48.75	42.75			
80140	**ADVANCED UNDER EYE SERUM W/STEM CELLS** • .33 fl. oz	49.00	36.75	31.50			
80139	**AMBER SELF MICRODERMABRASION** • 2 oz	49.00	36.75	31.50			
80158	**ANTI-AGING FACE OIL** • 1 fl. oz	59.00	44.25	39.00			
80118	**ANTI-AGING MASK** • 2 oz	72.00	54.00	47.52			
80151	**ANTI-AGING REJUVENATING FACE CREAM** • 2 oz	65.00	48.75	42.75			
80153	**ANTI-AGING REJUVENATING SCALP SERUM** • 2 fl. oz	46.00	34.50	29.25			
80134	**ANTI-OXIDANT SERUM W/BLUEBERRY & POMEGRANATE EXTRACTS** • 1 fl. oz	33.00	24.75	23.51			
80133	**ANTI-OXIDANT FACIAL MIST HYDRATOR** • 2 fl. oz	32.00	24.00	22.80			
80156	**COLLAGEN BOOSTING PEPTIDE SERUM** • 1 fl. oz	59.00	44.25	39.00			

SUBTOTAL OF COLUMN 3

ITEM No.	PRODUCT	Retail Each $	YOUR PRICE 1 Unit Each	4 Unit Each	10 Unit Each	QTY	Total
80169	**CUCUMBER HYDRA PEPTIDE EYE CREAM** • .5 oz	38.00	28.50	26.00			
80141	**DNA SUPPORT CREAM** • 1 oz	49.00	36.75	31.50			
80167	**ENVIRONMENTAL SUPPORT SERUM** • 1 fl. oz	59.00	44.25	39.00			
80108	**ESSENTIAL PLANT LIPIDS SERUM** • 1 fl. oz	74.95	56.21	49.46			
80163	**EYE LIFT CREAM** • 0.5 fl. oz	59.00	44.25	39.00			
80123	**FACE REJUVENATING ANTI-OXIDANT CREAM** • 2 oz	69.50	52.13	45.87			
80137	**ALL-PURPOSE SOOTHING RELIEF** • 1 oz	53.00	39.75	34.07			
80109	**HYALURONIC FACIAL MOISTURIZER** • 1 oz	58.00	43.50	38.28			
80110	**HYALURONIC OIL-FREE FACIAL MOISTURIZER** • 1 oz	58.00	43.50	38.28			
80138	**HYDRATING ANTI-OXIDANT FACE MIST** • 4 fl. oz	39.95	29.96	28.50			
80103	**LIFTING & TIGHTENING COMPLEX** • 1 oz	74.50	55.88	49.17			
80168	**MELATONIN ADVANCED PEPTIDE CREAM** • 1 oz	38.00	28.50	26.00			
80114	**MILD FACIAL CLEANSER** • 8 fl. oz	59.00	44.25	38.94			
80159	**MULTI STEM CELL SKIN TIGHTENING COMPLEX** • 1 fl. oz	59.00	44.25	39.00			
80122	**NECK REJUVENATING ANTI-OXIDANT CREAM** • 2 oz	64.00	48.00	42.24			
80150	**RENEWING EYE CREAM** • 1/2 oz	65.00	48.75	42.75			
80142	**RESVERATROL ANTI-OXIDANT SERUM** • 1 fl. oz	46.00	34.50	29.25			
80166	**SKIN FIRMING COMPLEX** • 1 fl. oz (2 units $34.50)	53.00	39.75				
80112	**SKIN LIGHTENING SERUM** • 1/2 fl. oz	85.00	63.75	56.10			
80130	**SKIN STEM CELL SERUM** • 1 fl. oz	74.00	55.50	51.75			
80164	**SKIN TONE EQUALIZER** • 0.4 fl oz	59.00	44.25	39.00			
80143	**STEM CELL CREAM W/ALPINE ROSE** • 1 oz	66.00	49.50	43.50			
80148	**TIGHTENING & FIRMING NECK CREAM** • 2 oz	39.00	29.25	26.25			
80161	**TRIPLE ACTION VITAMIN C CREAM** • 1 oz jar	59.00	44.25	39.00			
80162	**ULTIMATE MICRODERMABRASION** • 8 fl. oz	39.00	29.25	26.25			
80160	**ULTRA EYELASH BOOSTER** • 0.25 oz (2 units each $39)	59.00	44.25				
80116	**ULTRA LIP PLUMPER** • 1/3 oz	64.00	48.00	42.24			
80101	**ULTRA WRINKLE RELAXER** • 1 oz	89.95	67.46	59.82			
80113	**UNDER EYE REFINING SERUM** • 1/2 fl. oz	74.50	55.88	49.17			
80104	**UNDER EYE RESCUE CREAM** • 1/2 oz	74.50	55.88	49.17			
80129	**VITAMIN C SERUM** • 1 fl. oz	85.00	63.75	56.10			
80136	**VITAMIN D LOTION** • 4 oz	36.00	27.00	25.25			
80145	**VITAMIN E-ESSENTIAL CREAM** • 1 oz	28.00	21.00	19.50			
80102	**VITAMIN K CREAM** • 1 oz	79.50	59.63	52.47			
80149	**YOUTH SERUM** • 1 fl. oz	65.00	48.75	42.75			
	D						
00658	**7-KETO® DHEA METABOLITE** • 25 mg, 100 caps	28.00	21.00	18.00			
01479	**7-KETO® DHEA METABOLITE** • 100 mg, 60 veg. caps	40.00	30.00	27.00			
01640	**DHA** (Vegetarian) • 30 veg. softgels	20.00	15.00	13.50			
00607	**DHEA** • 25 mg, 100 tablets (Dissolve in mouth)	14.00	10.50	8.81			
00335	**DHEA** • 25 mg, 100 caps	16.00	12.00	11.00			
00454	**DHEA** • 15 mg, 100 caps	14.00	10.50	9.00			
00882	**DHEA** • 50 mg, 60 caps	19.00	14.25	12.75			
01689	**DHEA** • 100 mg, 60 veg. caps	24.00	18.00	16.50			
01478	**DHEA COMPLETE** • 60 veg. caps	48.00	36.00	32.40			

SUBTOTAL OF COLUMN 4

ITEM No.	PRODUCT	Retail Each $	YOUR PRICE 1 Unit Each	4 Unit Each	10 Unit Each	QTY	Total
30747	**DIGEST RC®** • 30 caps	19.95	14.96				
02021	**DIGESTIVE ENZYMES** (Enhanced Super) • 60 veg. caps	22.00	16.50	15.00			
02022	**DIGESTIVE ENZYMES W/PROBIOTICS** (Enhanced Super)•60 veg. caps	28.00	21.00	18.00			
01671	**D, L-PHENYLALANINE** • 500 mg, 100 veg. caps	18.75	14.06	12.00			
01540	**DMAE BITARTRATE** • 150 mg, 200 veg. caps	18.00	13.50	11.25			
02270	**DNA PROTECTION FORMULA** • 30 veg. caps	20.00	15.00	13.50			
01931	**DOG MIX** • 100 grams powder	18.00	13.50	11.25			
02006	**DOPA-MIND™** • 60 veg. tabs	44.00	33.00	28.00			
00321	**DR. PROCTOR'S ADVANCED HAIR FORMULA** • 2 oz	39.95	29.96	24.00			
00320	**DR. PROCTOR'S HAIR SHAMPOO** • 8 oz	24.95	18.71	16.50			
	E						
01997	**ENDOTHELIAL DEFENSE™ W/POMEGRANATE COMPLETE AND CORDIART™** • 60 softgels	68.00	51.00	46.50			
00997	**ENDOTHELIAL DEFENSE™ W/GLISODIN®** • 60 veg. caps	54.00	40.50	36.00			
02200	**EPA/DHA** (Clearly) • 120 softgels	30.00	22.50	20.00			
01937	**EPA/DHA** (Mega) • 120 softgels	20.00	15.00	13.50			
02033	**ESOPHACOOL™** • 60 chewable tablets	12.00	9.00	8.00			
01737	**ESOPHAGEAL GUARDIAN** (Berry flavor) • 60 chewable tablets	36.00	27.00	24.00			
01894	**ESTROGEN FOR WOMEN** • 30 veg. tabs	30.00	22.50	20.00			
01042	**EUROPEAN LEG SOLUTION DIOSMIN 95** 600 mg, 30 veg. tabs	20.00	15.00	13.50			
01706	**EXTRAORDINARY ENZYMES** • 60 caps	26.00	19.50	18.00			
02008	**(CALIFORNIA ESTATE) EXTRA VIRGIN OLIVE OIL** • 500 ml (16.9 fl. oz)	33.00	24.75	22.50			
01514	**EYE PRESSURE SUPPORT W/MIRTOGENOL®** • 30 veg. caps	38.00	28.50	25.50			
	F						
00965	**FAST-ACTING JOINT FORMULA** • 30 caps	39.00	29.25	27.00			
01717	**FAST-C® W/DIHYDROQUERCETIN** • 120 veg. tabs	26.00	19.50	18.00			
01064	**FEMMENESSENCE MACAPAUSE®** • 120 veg. caps	34.99	26.24				
02125	**FLORASSIST® GI W/PHAGE TECHNOLOGY**•30 liquid veg. caps	33.00	24.75	22.50			
01821	**FLORASSIST® HEART HEALTH** • 60 veg. caps	32.00	24.00	21.00			
02124	**FLORASSIST® IMMUNE HEALTH** • 30 veg. caps	26.00	19.50	18.00			
02120	**FLORASSIST® ORAL HYGIENE** • 30 lozenges	20.00	15.00	13.00			
01825	**FLORASSIST® BALANCE** • 30 liquid veg. caps	32.00	24.00	21.00			
02000	**FLORASSIST® MOOD** • 60 caps	33.00	24.75	22.50			
02208	**FLORASSIST® NASAL** • 30 veg. caps	36.00	27.00	24.00			
02203	**FLORASSIST® PREBIOTIC** •Strawberry flavor, 60 chewable tabs	20.00	15.00	13.00			
01920	**FLORASSIST® THROAT HEALTH** • 30 lozenges	20.00	15.00	13.50			
02212	**FOCUS TEA™** • Spearmint flavor, 14 stick packs	20.00	15.00	13.50			
01913	**FOLATE HIGH POTENCY** (Optimized) • 5,000 mcg, 30 veg. tablets	18.00	13.50	12.00			
01939	**FOLATE** (Optimized) • 1,000 mcg, 100 veg. tablets	15.00	11.25	10.00			
01842	**FOLATE + VITAMIN B12** (BioActive) • 90 veg. caps	12.00	9.00	8.00			
01544	**FORSKOLIN** • 10 mg, 60 veg. caps	16.00	12.00	10.50			
01513	**FUCOIDAN W/MARITECH® 926** (Optimized) • 60 veg. caps	36.00	27.00	24.75			
	G						
02070	**GAMMA E MIXED TOCOPHEROL/TOCOTRIENOLS** • 60 softgels	40.00	30.00	27.00			
02075	**GAMMA E MIXED TOCOPHEROL W/ENHANCED SESAME LIGNANS** • 60 softgels	32.00	24.00	21.75			
01394	**GARLIC** (Optimized) • 200 veg. caps	24.95	18.71	15.75			

SUBTOTAL OF COLUMN 5

ITEM No.	PRODUCT	Retail Each $	YOUR PRICE 1 Unit Each	4 Unit Each	10 Unit Each	QTY	Total
02100	**GASTRO-EASE™** • 60 veg. caps	44.00	33.00	30.00			
02119	**GEROPROTECT® AGELESS CELL™** • 30 softgels	40.00	30.00	27.00			
02133	**GEROPROTECT® LONGEVITY A.I.™** • 30 softgels	56.00	42.00	38.00			
**01122	**GINGER FORCE®** • 60 liquid caps	34.95	26.21				
01658	**GINKGO BILOBA CERTIFIED EXTRACT™** 120 mg, 365 veg. caps	50.00	37.50	33.00			
02218	**GLA WITH SESAME LIGNANS** (Mega) • 30 softgels	22.00	16.50	15.00			
00345	**(L-) GLUTAMINE CAPSULES** • 500 mg, 100 veg. caps	14.95	11.21	10.13			
00141	**(L-) GLUTAMINE POWDER** • 100 grams	22.00	16.50	15.00			
00522	**GLUCOSAMINE/CHONDROITIN CAPSULES** • 100 caps	38.00	28.50	24.00			
01541	**GLUTATHIONE, CYSTEINE & C** • 100 veg. caps	22.00	16.50	15.00			
02122	**GLYCEMIC GUARD™** • 30 veg. caps	42.00	31.50	28.00			
01669	**GLYCINE** • 1,000 mg, 100 veg. caps	12.00	9.00	8.10			
02211	**GRAPE SEED EXTRACT** 100 mg, 60 veg. caps	35.00	26.25	23.00			
01620	**GREEN COFFEE EXTRACT COFFEEGENIC®** 400 mg, 90 veg. caps	32.00	24.00	21.00			
00953	**GREEN TEA EXTRACT** (Mega)•lightly caffeinated,100 veg. caps	30.00	22.50	18.00			
00954	**GREEN TEA EXTRACT** (Mega)•decaffeinated, 100 veg. caps	30.00	22.50	18.00			
	H						
01074	**5 HTP** • 100 mg, 60 caps	27.95	20.96				
**02222	**HAIR, SKIN & NAILS REJUVENATION FORM W/VERISOL®** 120 tabs	32.00	24.00	22.00			
01738	**HCA** (Garcinia) • 90 veg. caps	17.00	12.75	11.25			
29754	**HCACTIVE™ GARCINIA CAMBOGIA EXTRACT** • 90 caps	30.00	22.50				
01393	**HEPATOPRO** • 900 mg, 60 softgels	50.00	37.50	34.50			
02121	**HOMOCYSTEINE RESIST** • 60 veg. caps	26.00	19.50	17.50			
01527	**HUPERZINE A** • 200 mcg, 60 veg. caps	40.00	30.00	27.00			
00661	**HYDRODERM®** • 1 oz	79.95	59.96	49.00			
	I						
01704	**IMMUNE MODULATOR W/TINOFEND®** • 60 veg. caps	17.00	12.75	11.25			
00955	**IMMUNE PROTECT W/PARACTIN®** • 30 veg. caps	29.50	22.13	19.91			
02005	**IMMUNE SENESCENCE PROTECTION FORMULA™** •60 veg. tabs	40.00	30.00	27.00			
01674	**INOSITOL CAPSULES** • 1,000 mg, 360 veg. caps	62.00	46.50	43.50			
01292	**INTEGRA-LEAN® AFRICAN MANGO IRVINGIA** 150 mg, 60 veg. caps	28.00	21.00	18.00			
30731	**IONIC SELENIUM** • 300 mg, 2 fl. oz	13.69	10.27				
01677	**IRON PROTEIN PLUS** • 300 mg, 100 caps	28.00	21.00	19.50			
01492	**IRVINGIA W/PHASE 3™ CALORIE CONTROL COMPLEX** (Optimized African Mango) • 120 veg. caps	56.00	42.00	36.00			
	J, K, L						
52142	**JARRO-DOPHILUS® PROBIOTIC FOR WOMEN** 30 enteric-coated veg. caps	27.95	20.96				
00056	**JARRO-DOPHILUS EPS®** • 60 veg. caps	23.95	17.96				
02034	**K W/ADVANCED K2 COMPLEX** (Super) • 90 softgels	30.00	22.50	20.25			
01600	**KRILL HEALTHY JOINT FORMULA** • 30 softgels	32.00	24.00	21.75			
01050	**KRILL OIL** (Jarrow)• 60 softgels	33.95	25.46				
00316	**KYOLIC® GARLIC FORMULA 102** • 200 veg. caps	28.55	21.41				
00789	**KYOLIC® RESERVE** • 600 mg, 120 caps	30.15	22.61				

SUBTOTAL OF COLUMN 6

ITEM No.	PRODUCT	Retail Each $	YOUR PRICE 1 Unit Each	4 Unit Each	10 Unit Each	QTY	Total
01681	**LACTOFERRIN** • 60 caps	44.00	33.00	30.00			
00020	**LECITHIN** • 16 oz granules	18.00	13.50	12.00			
02255	**LIFE EXTENSION MIX™** • 240 tablets	74.00	55.50	48.00	42.00		
02257	**LIFE EXTENSION MIX™ W/EXTRA NIACIN** • 240 tablets	74.00	55.50	48.00	42.00		
02254	**LIFE EXTENSION MIX™** • 360 caps	78.00	58.50	50.00	44.00		
02256	**LIFE EXTENSION MIX™ POWDER** • 12.70 oz	72.00	54.00	46.00	40.00		
02265	**LIFE EXTENSION MIX™** • 240 tablets W/O copper	74.00	55.50	48.00	42.00		
02264	**LIFE EXTENSION MIX™** • 360 caps W/O copper	78.00	58.50	50.00	44.00		
01608	**LIVER EFFICIENCY FORMULA** • 30 veg. caps	18.00	13.50	12.00			
01639	**5-LOX INHIBITOR W/APRÈSFLEX®** • 100 mg, 60 veg. caps	22.00	16.50	15.00			
01678	**L-LYSINE** • 620 mg, 100 veg. caps	9.00	6.75	6.00			
00455	**LYCOPENE** (Mega) • 15 mg, 90 softgels	35.00	26.25	22.50			
	M						
01992	**MACUGUARD® OCULAR SUPPORT W/SAFFRON•** 60 softgels	25.00	18.75	17.50			
01993	**MACUGUARD® OCULAR SUPPORT W/SAFFRON & ASTAXANTHIN•** 60 softgels	44.00	33.00	30.00			
01459	**MAGNESIUM CAPS** • 500 mg, 100 veg. caps	12.00	9.00	7.50			
01682	**MAGNESIUM (CITRATE)** • 160 mg, 100 veg. caps	13.00	9.75	8.50			
02107	**(EXTEND-RELEASE) MAGNESIUM** • 60 veg. caps	13.00	9.75	8.75			
02209	**MALE VASCULAR SEXUAL SUPPORT** • 30 veg. caps	24.00	18.00	16.00			
01908	**MEDITERRANEAN TRIM WITH SINETROL™-XPUR** 60 veg. caps	18.00	13.50	12.00			
02109	**MEDITERRANEAN WHOLE FOOD BLEND** • 90 veg. caps	44.00	33.00	30.00			
01668	**MELATONIN** • 300 mcg, 100 veg. caps	7.00	5.25	4.50			
01083	**MELATONIN** • 500 mcg, 200 veg. caps	18.00	13.50	12.00			
00329	**MELATONIN** • 1 mg, 60 caps	5.00	3.75	3.47			
00330	**MELATONIN** • 3 mg, 60 veg. caps	8.00	6.00	5.16			
00331	**MELATONIN** • 10 mg, 60 veg. caps	28.00	21.00	18.00			
00332	**MELATONIN** • 3 mg, 60 veg. lozenges	8.00	6.00	5.16			
02234	**MELATONIN** (Fast-Acting Liquid) • 2 fl. oz (Citrus-Vanilla)	12.00	9.00	8.25			
02201	**MELATONIN IR/XR** • 60 caps	12.00	9.00	7.50			
01787	**MELATONIN TIMED RELEASE** • 300 mcg, 100 veg. tabs	12.00	9.00	8.25			
01788	**MELATONIN TIMED RELEASE** • 750 mcg, 60 veg. tablets	8.00	6.00	5.25			
01786	**MELATONIN TIMED RELEASE** • 3 mg, 60 veg. tabs	12.00	9.00	8.25			
02101	**MEMORY PROTECT** • 36 day supply	24.00	18.00	16.00			
02204	**MENOPAUSE 731™** • 30 tablets	36.00	27.00	24.00			
01536	**METHYLCOBALAMIN** • 1 mg, 60 veg. lozenges (vanilla)	9.95	7.46	6.00			
01537	**METHYLCOBALAMIN** • 5 mg, 60 veg. lozenges (vanilla)	32.00	24.00	18.75	17.25		
00709	**MIGRA-EEZE™** (Butterbur) • 60 softgels	33.00	24.75	22.00			
01522	**MILK THISTLE** (European) • 60 veg. caps	34.00	25.50	22.50			
01922	**MILK THISTLE** (European) • 60 softgels	28.00	21.00	18.75			
01925	**MILK THISTLE** (European) • 120 softgels	44.00	33.00	30.00			
01940	**MIRAFORTE W/STANDARDIZED LIGNANS** (Super) • 120 veg caps	62.00	46.50	42.00			
01869	**MITOCHONDRIAL BASICS W/PQQ** • 30 caps	40.00	30.00	27.00			
01868	**MITOCHONDRIAL ENERGY OPTIMIZER W/PQQ** •120 caps	68.00	51.00	45.00			
00065	**MK-7** • 90 mcg, 60 softgels	28.00	21.00	18.75			
00451	**MSM** (Methylsulfonylmethane) • 1,000 mg, 100 caps	14.00	10.50	8.96			
	SUBTOTAL OF COLUMN 7						

ITEM No.	PRODUCT	Retail Each $	YOUR PRICE 1 Unit Each	4 Unit Each	10 Unit Each	QTY	Total
	N						
01534	**N-ACETYL-L-CYSTEINE** • 600 mg, 60 veg. caps	14.00	10.50	9.25			
01904	**NAD+ CELL REGENERATOR™** • 100 mg, 30 veg. caps	24.00	call for pricing				
02144	**NAD+ CELL REGENERATOR™ NICOTINAMIDE RIBOSIDE** 250 mg, 30 veg. caps	48.00	call for pricing				
02148	**NAD+ CELL REGENERATOR™ W/RESVERATROL** (Optimized) 30 veg. caps	54.00	call for pricing				
01603	**NEURO-MAG® MAGNESIUM L-THREONATE** • 90 veg. caps	40.00	30.00	27.00			
02032	**NEURO-MAG® MAGNESIUM L-THREONATE** 93.35 grams • Tropical Punch Flavor	38.00	28.50	26.00			
01990	**NITROVASC W/CORDIART™** • 30 veg. caps	18.00	13.50	12.00			
01903	**NK CELL ACTIVATOR™** • 30 veg. tablets	45.00	33.75	31.50			
00373	**NO FLUSH NIACIN** • 800 mg, 100 caps	19.00	14.25	12.75			
	O						
01824	**OLIVE LEAF VASCULAR SUPPORT W/CELERY SEED EXTRACT** (Advanced) • 60 veg. caps	36.00	27.00	24.00			
01988	**OMEGA-3 PLUS EPA/DHA W/SESAME LIGNANS, OLIVE EXTRACT, KRILL & ASTAXANTHIN** (Super)• 120 softgels	45.00	33.75	31.50	24.75		
01983	**OMEGA-3 EPA/DHA W/SESAME LIGNANS & OLIVE EXTRACT** (Super) • 60 softgels	18.00	13.50	12.00	9.38		
01982	**OMEGA-3 EPA/DHA W/SESAME LIGNANS & OLIVE EXTRACT** (Super) • 120 softgels	32.00	24.00	21.00	17.05		
01984	**OMEGA-3 EPA/DHA W/SESAME LIGNANS & OLIVE EXTRACT** (Super) • 120 enteric coated softgels	34.00	25.50	23.25	18.00		
01985	**OMEGA-3 EPA/DHA W/SESAME LIGNANS & OLIVE EXTRACT** (Super) • 60 enteric coated softgels	20.00	15.00	13.50	10.50		
01986	**OMEGA-3 EPA/DHA W/SESAME LIGNANS & OLIVE EXTRACT** (Super) • 240 small softgels	32.00	24.00	21.00	17.25		
02092	**ONCE-DAILY HEALTH BOOSTER** • 30 softgels	30.00	22.50	20.00			
02091	**ONCE-DAILY HEALTH BOOSTER** • 60 softgels	54.00	40.50	38.00			
02213	**ONE-PER-DAY** • 60 tablets	23.00	17.25	16.00			
01328	**ONLY TRACE MINERALS** • 90 veg. caps	15.00	11.25	9.38			
	P						
01789	**PALMETTOGUARD® SAW PALMETTO W/BETA-SITOSTEROL** 30 softgels	15.00	11.25	10.50	9.00		
01790	**PALMETTOGUARD® SAW PALMETTO/ NETTLE ROOT W/BETA-SITOSTEROL** • 60 softgels	28.00	21.00	19.50	18.00		
*00342	**PECTA SOL-C® MODIFIED CITRUS PECTIN** • 454 grams powder	113.95	96.86				
*01080	**PECTA SOL-C® MODIFIED CITRUS PECTIN** • 270 veg. caps	82.95	70.51				
01811	**PEONY IMMUNE** • 60 veg. caps	36.00	27.00	24.00			
**00673	**PGX® PLUS MULBERRY** (WellBetX®) • 180 veg. caps	34.95	26.21				
01953	**POMEGRANATE COMPLETE** • 30 softgels	24.00	18.00	15.75			
00956	**POMEGRANATE FRUIT EXTRACT** • 30 veg. caps	19.50	14.63	13.16			
**01837	**POMI-T®** • 60 veg. caps	38.00	28.50	26.00			
00577	**POTASSIUM IODIDE** • 130 mg, 14 tabs	6.95	5.21	3.94			
01500	**PQQ CAPS** • 10 mg, 30 veg. caps	18.00	13.50	11.00	10.00		
01647	**PQQ CAPS** • 20 mg, 30 veg. caps	32.00	24.00	18.00	17.00		
00302	**PREGNENOLONE** • 50 mg, 100 caps	26.00	19.50	16.50			
00700	**PREGNENOLONE** • 100 mg, 100 caps	30.00	22.50	20.25			
**01373	**PRELOX® ENHANCED SEX FOR MEN** • 60 tablets	52.00	39.00	36.00			
	SUBTOTAL OF COLUMN 8						

ITEM No.	PRODUCT	Retail Each $	YOUR PRICE 1 Unit Each	4 Unit Each	10 Unit Each	QTY	Total
00525	**PROBOOST™ THYMIC PROTEIN A** • 30 packets	66.60	49.95				
01441	**PROGESTA-CARE®** • 4 oz cream	36.39	27.29	25.72			
02029	**PROSTATE FORMULA** (Ultra) • 60 softgels	38.00	28.50	26.25	24.00		
01909	**PROSTAPOLLEN™** (Triple strength) • 30 softgels	28.00	21.00	18.75			
02261	**PROTEIN CONCENTRATE** (Whey) Chocolate • 640 gram	30.00	22.50	19.95			
02260	**PROTEIN CONCENTRATE** (Whey) Vanilla • 500 grams	30.00	22.50	19.95			
02246	**PROTEIN ISOLATE** (Advanced Whey) Vanilla • 454 grams	30.00	22.50	19.50			
02243	**PROTEIN ISOLATE** (Whey) Chocolate • 437 grams	30.00	22.50	19.50			
02242	**PROTEIN ISOLATE** (Whey) Vanilla • 403 grams	30.00	22.50	19.50			
02127	**PROTEIN (PLANT) COMPLETE & AMINO ACID COMPLEX** • 15.87 oz 15.87 oz	34.00	25.50	23.00			
01812	**PROVINAL® PURIFIED OMEGA-7** • 30 softgels	27.00	20.25	18.00			
01676	**PS CAPS** (Phosphatidylserine) • 100 mg, 100 veg. caps	54.00	40.50	36.00			
01209	**PUMPKIN SEED EXTRACT** (Water-soluble) • 60 veg. caps	20.00	15.00	13.50			
01637	**PYCNOGENOL® FRENCH MARITIME PINE BARK EXTRACT** 100 mg, 60 veg. caps	64.00	48.00	45.00			
01217	**PYRIDOXAL 5'-PHOSPHATE** • 100 mg, 60 veg. caps	22.00	16.50	14.85			
	Q, R						
01309	**QUERCETIN** (Optimized) • 250 mg, 60 veg. caps	22.00	16.50	15.00			
02169	**RAINFOREST BLEND GROUND COFFEE** • 12 oz. bag	13.00	9.75				
02173	**RAINFOREST BLEND GROUND COFFEE** Natural Mocha • 12 oz. bag	15.00	11.25				
02172	**RAINFOREST BLEND GROUND COFFEE** Natural Vanilla • 12 oz. bag	15.00	11.25				
02171	**RAINFOREST BLEND WHOLE BEAN COFFEE** 12 oz. bag	13.00	9.75				
02170	**RAINFOREST BLEND DECAFFEINATED ROAST GROUND COFFEE** 12 oz. bag	14.00	10.50				
01030	**RED YEAST RICE** (Bluebonnet) • 600 mg, 60 veg. caps	18.08	13.56				
00605	**REGIMINT** • 60 enteric-coated caps	19.95	14.96	14.00			
01708	**REISHI EXTRACT MUSHROOM COMPLEX** • 60 veg. caps	30.00	22.50	20.25			
01448	**REJUVENEX® BODY LOTION** • 6 fl. oz	24.00	18.00	14.85	12.75		
01621	**REJUVENEX® FACTOR FIRMING SERUM** • 1.7 oz	65.00	48.75	37.50			
01220	**REJUVENEX®** (Ultra) • 2 oz	52.00	39.00	33.00	29.25		
00676	**REJUVENIGHT®** (Ultra) • 2 oz	39.95	29.96	27.00			
02210	**RESVERATROL** • 100 mg, 60 veg. caps	32.00	24.00	21.00			
02230	**RESVERATROL** (Optimized) • 60 veg. caps	45.00	33.75	30.00			
00889	**RHODIOLA EXTRACT** • 250 mg, 60 veg. caps	14.00	10.50	9.00			
01900	**RIBOGEN™ FRENCH OAK WOOD EXTRACT** 200 mg, 30 veg. caps	36.00	27.00	24.75			
00972	**(D) RIBOSE POWDER** • 150 grams	27.50	20.63	18.56			
01473	**(D) RIBOSE TABLETS** • 100 veg. tabs	32.00	24.00	21.00			
01208	**R-LIPOIC ACID** (Super) • 240 mg, 60 veg. caps	49.00	36.75	33.75			
00070	**RNA CAPSULES** • 500 mg, 100 caps	17.95	13.46	12.12			
	S						
01432	**SAFFRON W/SATIEREAL®** (Optimized) • 60 veg. caps	36.00	27.00	24.00			
02175	**SAMe** (S-Adenosyl-Methionine) 200 mg, 30 enteric coated tablets	25.00	18.75	16.50			
02176	**SAMe** (S-Adenosyl-Methionine) 400 mg, 30 enteric coated tablets	36.00	27.00	24.00			

SUBTOTAL OF COLUMN 9

ITEM No.	PRODUCT	Retail Each $	YOUR PRICE 1 Unit Each	4 Unit Each	10 Unit Each	QTY	Total
02174	**SAMe** (S-Adenosyl-Methionine) 400 mg, 60 enteric coated tablets	66.00	49.50	45.00			
01740	**SEA-IODINE™** • 1,000 mcg, 60 veg. caps	8.00	6.00	5.40			
01879	**SE-METHYL L-SELENOCYSTEINE** • 200 mcg, 90 veg. caps	11.00	8.25	7.50			
00318	**SERRAFLAZYME** • 100 tablets	18.00	13.50	12.00			
01626	**SEX FOR WOMEN 50+** (Enhanced) • 90 veg. caps	59.00	44.25	34.00			
01938	**SHADE FACTOR™** • 120 veg. caps	44.00	33.00	30.00			
02110	**SHADE FACTOR™ SUNSCREEN LOTION** • 4 fl. oz	20.00	15.00	13.00			
02118	**SHADE FACTOR™ SUNSCREEN SPRAY** • 6 fl. oz	22.00	16.50	14.25			
01884	**SILYMARIN** • 100 mg, 90 veg. caps	14.00	10.50	9.50			
02129	**SKIN CARE COLLECTION ANTI-AGING SERUM** • 1.75 fl. oz	60.00	45.00	37.50			
02132	**SKIN CARE COLLECTION BODY LOTION** • 6 oz	28.00	21.00	18.00			
02130	**SKIN CARE COLLECTION DAY CREAM** • 1.65 oz	50.00	37.50	33.00			
02131	**SKIN CARE COLLECTION NIGHT CREAM** • 1.65 oz	39.00	29.25	27.00			
02096	**SKIN RESTORING CERAMIDES** 30 liquid veg. caps	25.00	18.75	17.25			
01444	**SLEEP** (Quiet) • 60 veg. caps	13.00	9.75	7.50			
01445	**SLEEP MELATONIN** (Quiet) • 5 mg, 60 veg. caps	18.00	13.50	12.00			
01551	**SLEEP W/ MELATONIN** (Enhanced) • 30 caps	22.00	16.50	15.00			
01511	**SLEEP W/O MELATONIN** (Enhanced) • 30 caps	22.00	16.50	15.00			
00961	**SODZYME® W/GLISODIN® & WOLFBERRY** • 90 veg. caps	28.00	21.00	18.00			
00657	**SOLARSHIELD® SUNGLASSES** • Smoke color	12.99	9.74	8.63			
01097	**SOY EXTRACT** (Ultra) • 150 veg. caps	76.00	57.00	50.00			
01649	**SOY ISOFLAVONES** (Super Absorbable) • 60 veg. caps	28.00	21.00	18.75			
00432	**STEVIA™** (Better) • 100 packets, 1 gram each	9.95	7.46				
00438	**STEVIA™ ORGANIC LIQUID SWEETENER** (Better) • 2 oz	11.00	8.25				
00987	**STRESS RELIEF** (Enhanced) • 30 veg. caps	28.00	21.00	18.00			
01476	**STRONTIUM** • 750 mg, 90 veg. caps	20.00	15.00	13.50			
01778	**SUPER SELENIUM COMPLEX** • 200 mcg, 100 veg. caps	14.00	10.50	9.00	8.25		
	T						
02023	**TART CHERRY W/CHERRYPURE®** 60 veg. caps	20.00	15.00	14.00			
01827	**TAURINE** • 1,000 mg, 90 veg. caps	13.00	9.75	9.00			
02205	**TEA CRYSTALS** (Kenyan Green) • 14 stick packs	12.00	9.00	8.00			
02206	**TEA CRYSTALS** (Kenyan Purple) • 14 stick packs	18.00	13.50	12.00			
01918	**TEAR SUPPORT W/MAQUIBRIGHT®** • 60 mg, 30 veg. caps	18.00	13.50	12.00			
00133	**L-TAURINE POWDER** • 300 grams	20.00	15.00	12.66			
*13685	**TEN MUSHROOM FORMULA®** • 120 veg. caps	41.95	35.66				
01304	**THEAFLAVIN STANDARDIZED EXTRACT** • 30 veg. caps	18.00	13.50	12.00			
01683	**(L) THEANINE** • 100 mg, 60 veg. caps	24.00	18.00	15.38			
***01038	**THERALAC® PROBIOTICS** • 30 caps	47.95	35.96				
00668	**THYROID FORMULA** (Metabolic Advantage™) • 100 caps	21.95	16.46				
00349	**TMG POWDER** • 50 grams	14.00	10.50	8.25			
01859	**TMG** • 500 mg, 60 liquid veg. caps	13.00	9.75	9.00			
01400	**TOCOTRIENOLS** (Super Absorbable) • 60 softgels	30.00	22.50	21.00			
01278	**TOOTHPASTE** • 4 oz tube (Mint)	9.50	7.13	6.50			

SUBTOTAL OF COLUMN 10

ITEM No.	PRODUCT	Retail Each $	YOUR PRICE 1 Unit Each	4 Unit Each	10 Unit Each	QTY	Total
01917	**TRANQUIL TRACT™** • 60 veg. caps	52.00	39.00	34.50			
01468	**TRIPLE ACTION CRUCIFEROUS VEGETABLE EXTRACT** 60 veg. caps	24.00	18.00	16.50			
01469	**TRIPLE ACTION CRUCIFEROUS VEGETABLE EXTRACT W/RESVERATROL** • 60 veg. caps	32.00	24.00	22.20			
02003	**TRIPLE ACTION THYROID** • 60 veg. caps	36.00	27.00	24.00			
01803	**TRI SUGAR SHIELD®** • 60 veg. caps	36.00	27.00	24.00			
01386	**TRUFIBER™** • 180 grams	32.95	24.71				
01389	**TRUFLORA® PROBIOTICS** • 32 veg. caps	42.95	32.21				
01722	**L-TRYPTOPHAN** • 500 mg, 90 veg. caps	33.00	24.75	22.50			
01721	**TRYPTOPHAN PLUS** (Optimized) • 90 veg. caps	32.00	24.00	21.75			
02216	**TWO-PER-DAY** • 60 tablets	12.00	9.00	7.50			
02215	**TWO-PER-DAY** • 120 tablets	23.00	17.25	15.50			
02217	**TWO-PER-DAY** • 60 caps	13.00	9.75	8.50			
02214	**TWO-PER-DAY** • 120 caps	24.00	18.00	16.00			
00326	**L-TYROSINE** • 500 mg, 100 tablets	13.50	10.13				
	U, V						
01921	**URIC ACID CONTROL** • 60 veg. caps	24.00	18.00	16.50			
00213	**VANADYL SULFATE** • 7.5 mg, 100 veg. tablets	15.00	11.25	9.38			
02102	**VENOFLOW™** • 30 veg. caps	52.00	39.00	36.00			
00408	**VENOTONE** • 60 caps	18.95	14.21	12.00			
01327	**VINPOCETINE** • 10 mg, 100 veg. tablets	18.00	13.50	10.50			
00372	**VITAMIN B3 NIACIN** • 500 mg, 100 caps	7.65	5.74	4.99			
02028	**VITAMIN B5** • 500 mg, 100 veg. caps (Pantothenic Acid)	14.00	10.50	9.50			
01535	**VITAMIN B6** • 250 mg, 100 veg. caps	12.50	9.38	8.25			
00361	**VITAMIN B12** • 500 mcg, 100 lozenges	8.75	6.56	5.44			
01634	**VITAMIN C W/DIHYDROQUERCETIN** 1,000 mg, 60 veg. tablets	10.00	7.50	6.75			
00927	**VITAMIN C W/DIHYDROQUERCETIN** 1,000 mg, 250 veg. tablets	30.00	22.50	20.00			
00084	**VITAMIN C POWDER** (Buffered) • 454 grams	28.00	21.00	19.00			
01736	**VITAMIN C-MAGNESIUM CRYSTALS** (Effervescent) • 180 grams	20.00	15.00	13.50			
02232	**VITAMIN D3** • 2,000 IU, 1 fl. oz, Mint flavor	28.00	21.00	18.75			
01753	**VITAMIN D3** • 1,000 IU, 90 softgels	7.00	5.25	4.50			
01751	**VITAMIN D3** • 1,000 IU, 250 softgels	12.50	9.38	8.44			
01713	**VITAMIN D3** • 5,000 IU, 60 softgels	10.00	7.50	6.50			
01718	**VITAMIN D3** • 7,000 IU, 60 softgels	14.00	10.50	9.45			
01758	**VITAMIN D3 W/SEA-IODINE™** • 5,000 IU, 60 caps	14.00	10.50	9.38			
02244	**VITAMIN D3 LIQUID** • 2,000 IU, 1 fl. oz	28.00	21.00	18.75			
02040	**VITAMINS D AND K W/SEA-IODINE™** • 60 caps	24.00	18.00	16.50			
01863	**VITAMIN E** (Super) • 400 IU, 90 softgels	28.00	21.00	19.50	18.00		
01936	**VITAMIN K2** (Low dose) • 45 mcg, 90 softgels	18.00	13.50	12.00			
	W						
01902	**WAIST-LINE CONTROL™** • 120 veg. caps	42.00	31.50	28.50			
	X, Y						
01919	**X-R SHIELD** • 90 veg. caps	15.00	11.25	9.75			
00409	**XYLIWHITE™ MOUTHWASH** • 16 fl. oz	10.00	7.50				

SUBTOTAL OF COLUMN 11

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

SUBTOTAL OF COLUMN 12

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