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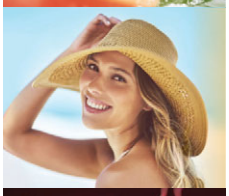

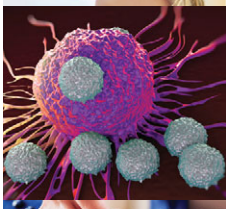

7 REVERSE MARKERS OF PROSTATE CANCER

Despite prostate cancer being the second leading cause of **cancer death** in men, a raging debate has ensued as to whether men should have annual PSA **blood tests**. The scales are tilting in favor of Life Extension®'s multi-decade campaign to educate men about the importance of regular **PSA screening**. Not only are there proven ways to reverse rising **PSA** levels, but breakthrough treatments can enable safer diagnosis and curative treatment without the side effects associated with conventional surgery and radiation.

DEPARTMENTS

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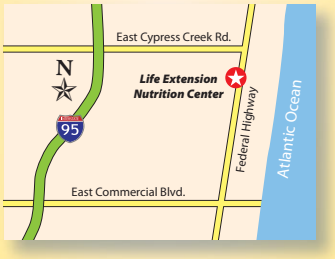

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LifeExtension® Magazine

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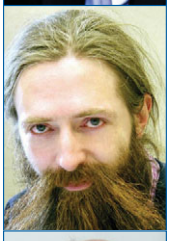

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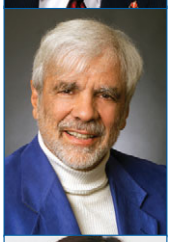

Jonathan V. Wright, MD, is medical director of the Tahoma Clinic in Tukwila, WA. He received his MD from the University of Michigan and has taught natural biochemical medical treatments since 1983. Dr. Wright pioneered the use of bioidentical estrogens and DHEA in daily medical practice. He has authored 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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How to Reverse Markers of Prostate Cancer

BY WILLIAM FALOON

Prostate cancer will be diagnosed in more than **180,000** American men this year. About **26,000** will die from **metastatic** disease that originates in the **prostate gland**.[1]

The prostate-specific antigen **(PSA)** blood test enables ***early*** detection that leads to higher **cure** rates.[2]

Despite prostate cancer being the second leading cause of **cancer mortality** in American men,[1] there has been a raging debate as to whether **screening** for the **PSA** should be done.[2]

An argument against screening for **PSA** is that it can result in overtreatment and complications that would not occur had the man remained blissfully ignorant that he may harbor a prostate malignancy.

Our rebuttal is that ***early*** detection is saving thousands of American men agonizing deaths from **metastatic** prostate cancer each year.

The debate over **PSA screening** is mercifully turning in a more rational direction. This is occurring because of improvements in the ***quality*** of management of patients with **low-grade** prostate cancer in the United States.

Even more exciting are new findings that show substantial reductions in prostate cancer incidence, progression, and mortality in response to healthier lifestyle choices. This means that it's never too late to proactively protect against this malignancy that impacts so many men.

In this issue of ***Life Extension***®, we describe novel curative procedures along with natural methods to prevent and reverse low-grade prostate disease.

In **2005**, the results of a small study were released that showed that markers of prostate cancer were reversed in patients with clinically relevant disease who made comprehensive **lifestyle changes**. Such changes included eating a diet low in fat, but rich in fruits and vegetables, along with regular exercise.[3]

The findings showed that in the **control** group, PSA levels increased indicating progression (worsening) of their disease.

In the comprehensive **lifestyle change** group, PSA levels decreased, indicating a probable regression of their prostate malignancies. Those who complied most with the healthy lifestyle changes had the greatest reductions in **PSA** blood levels.

Most interesting from this same study was a finding that took **blood serum** from the participants and added it to a petri dish of dividing human prostate cancer cells. Recall both groups consisted of men with clinically relevant prostate cancer.

The control group's serum inhibited tumor growth by **9%**, whereas serum from the comprehensive **lifestyle group** inhibited tumor growth an astounding **70%**.

This discovery indicates that **healthy lifestyle choices** result in the **blood** of a prostate cancer patient gaining powers that **impede tumor growth**.

This 2005 study was conducted by Dean Ornish, MD, and colleagues who speculated that the healthy lifestyles they advocated to reverse coronary artery disease might also help reverse prostate cancer.

This latter speculation should come as no surprise because the factors associated with health do not distinguish between heart disease and cancer, and in fact, the very same factors are implicated in all aspects of inflammation and aging. This is the integrative nature of health versus disease.

Expanding on This Pioneering Research

Over the past three years, an avalanche of new human research reveals which **dietary** constituents and lifestyle interventions increase or decrease **prostate cancer** risk.

For those with low-grade prostate cancer, this new data provides dietary guidelines that may enable one to control their disease with **active surveillance**, which is a more contemporary way of saying what used to be called "watchful waiting."

Dr. Dean Ornish advocated an across-the-board very **low-fat** diet that was difficult to comply with. Newer studies are showing it is the **type** of fat one eats that dictates risk of dying from prostate cancer.

In a **2015** published study, a group of 926 men with nonmetastatic **prostate cancer** were evaluated over a median **10-year** period.[4] The diets of these men were categorized either as a "**Prudent**" pattern (characterized by a higher intake of vegetables, fruits, fish, legumes, and whole grains) or as a "**Western**" pattern (characterized by a higher intake of processed foods and red meats, as well as high-fat dairy products and refined grains).

In these 926 men with clinically diagnosed prostate cancer, those who consumed the "**Western**" pattern diet had a **2.53-fold** increase in prostate cancer-specific **mortality**. This was especially evident for men who consumed the most **saturated fat** compared to **polyunsaturated** vegetable fats.[4]

Secondary analysis of the data by the same group of researchers found that men who consumed more than three servings of **dairy** foods daily had a **76%** higher **all-cause mortality risk** and **141%** higher **prostate cancer-specific risk** compared to men who consumed less than one serving a day of dairy food.[5]

These studies clearly showed higher mortality (death rates) in prostate cancer patients who consumed unhealthy "**Western**" pattern diets. It went further to show that higher intake of **dairy foods** increased risk of dying even more in men already diagnosed with prostate cancer.

These recent and robust studies provide intriguing evidence that one's diet has a tremendous impact on whether prostate cancer turns lethal and further validates the importance of annual **PSA screening**.

If a **blood test** shows a high or rising **PSA** level, this provides an ***early-warning*** indicator for a man to improve his diet and make other changes that are associated with reduced **PSA** and reduced **mortality**.

Equally important is the fact that a high or rising PSA level might require additional diagnostic tests as it could relate to a growing or metastasizing prostate cancer.

Blood Levels of Specific Nutrients Correlate with PSA Levels

Whether one is diagnosed with prostate cancer or worried about a steadily rising PSA, the objective is to get the PSA blood level down.

A study published in **2015** evaluated levels of **carotenoids** and **vitamin E** in the blood of men with recurring prostate cancer as evidenced by rising PSA. These were men who were previously treated with surgery or radiation but had ***recurring*** disease based on steadily elevating **PSA** blood levels.

After three months, men with higher blood levels of **lutein** and **zeaxanthin** showed lower **PSA** results. After six months, men with higher blood levels of **vitamin E**, **lycopene**, and **cryptoxanthin** had lower **PSA** readings.[6]

The researchers who conducted this study concluded that "*…**greater intake of foods containing these micronutrients might be beneficial to men with PSA-defined PrCA [prostate cancer] recurrence***."

A **2014** study looked at men with recurring prostate cancer in relationship to their **folate** intake. The overall findings showed no relationship between folate intake and cancer recurrence.[7]

A secondary analysis of the data, however, looked at men initially treated by radical ***prostatectomy*** (surgical removal of prostate gland). In this surgery-treated group, those with the lowest intake of **folate** from **foods** and **supplements** had a **2.6-fold** increase in the risk of cancer recurrence. In patients treated with external beam radiation and radioactive seed implantation (brachytherapy), there was no evidence of an association between prostate cancer progression and increased folate intake.[7]

A **2013** study on men with recurrent disease after radical prostatectomy showed that higher serum (blood) levels of **folate** was independently associated with a **58%** reduced risk of biochemical recurrence (as measured by PSA analysis).[8]

The take-home lesson from these recent studies is the urgent need for those with prostate cancer to follow healthy eating patterns and those who wish to avoid contracting the disease to do the same.

Most Aging Men Have Cancer Cells in Their Prostate Gland

The **prostate gland** is especially vulnerable to **malignant** transformation, yet the vast majority of aging men that harbor prostate cancer cells never develop clinically relevant disease.

Unlike more virulent cancers, there are a number of natural barriers that enable prostate tumors to be contained within the prostate gland. Some of these barriers include nutrients, hormones, drugs, and dietary factors that influence the ability of prostate cancer cells to survive and propagate.

Any aging individual with a **PSA** reading over **1.0 ng/mL** should be concerned that they may have an early-stage prostate issue that can respond to lifestyle/dietary alterations.

With the availability of **low-cost** blood testing, one can easily check their **PSA level** three months after initiating healthier lifestyle patterns to see if they are achieving a reduction in this biomarker (PSA) of potential prostate cancer activity.

What's interesting is that the same healthy lifestyle patterns that reduce prostate cancer risk, reduce prostate cancer progression, and reduce prostate cancer death also have been shown to reduce risk of overall **mortality**.[4]

Studies Strongly Link Diet to Prostate Cancer

A wealth of published data strongly and consistently links what a man eats to his future risk of developing prostate cancer.

A study published in **2015** looked at men residing in rural Pakistan and found that frequent consumption of **red meat** and fat increased prostate cancer risk **3.4-fold**.

This same study showed that greater consumption of **vegetables**, **fruit**, and **fluids** decreased prostate cancer risk by **79%** to **91%**![9]

Another study published in **2015** looked at **vitamin E** intake in a large group of men. Compared to the highest *versus* lowest dietary intakes of ***alpha tocopherol***, there was a **66%** decreased risk of developing prostate cancer. When ***gamma tocopherol*** intake was evaluated, there was a **55%** decreased risk in the highest *versus* lowest group.[10]

A study published in **2014** looked at the dietary patterns of Iranian men and found a strong protective effect against prostate cancer in response to higher intakes of fruits and vegetables. Men in the highest intake range of plant foods like cabbage, tomatoes, apples, and pomegranate had a **67%** reduced prostate cancer risk.[11]

A study of Italian men published in **2014** looked at dietary patterns and their association with a man's odds of developing prostate cancer. Men who ate the most animal products or starchy foods had a **1.5-fold** increased rate of prostate cancer. Men whose diets contained the most vitamins and fiber had a **7%** decreased risk.[12]

These recent studies emanating from around the world consistently show substantial prostate cancer risk reductions in response to healthy dietary practices.

Role of Obesity in Prostate Cancer Progression

Heavier men are at greater risk for benign and malignant prostate disease.

A study published in **2014** evaluated 565 men who were undergoing **active surveillance** for **prostate cancer**. Of this group, 124 were obese (body mass index [BMI] higher than **30 kg/m2**).[13]

A follow-up finding showed that each **5-unit** increase in the body mass index score was associated with a **1.5-fold** increased risk of pathologic progression and **1.4-fold** increased risk of therapeutic progression in these men with clinically relevant prostate cancer.

In the Patient Summary of this study, the authors concluded:

"Our study is the first to suggest that obesity is associated with a higher risk of cancer progression while on AS [active surveillance]. Further research is needed to determine if diet and exercise can decrease the risk of cancer progression while on AS [active surveillance]."[13]

The association between obesity and prostate cancer is well documented in the literature showing that men with the highest body mass index scores have the highest risk for advanced prostate cancer.[14]

The connection between obesity and low grade-chronic inflammation is partly to blame, providing a window of opportunity to reduce such risk through dietary changes. And this is precisely what was seen on a recent study by the *British Journal of Nutrition*. Researchers measured the "**dietary inflammatory index**" to predict the risk of prostate cancer. The results showed that men in the two highest **dietary inflammatory index quatiles** had a **32%** increased risk compared to men in the lowest inflammatory index quartile.[15]

Why PSA Testing Is so Critical

If an elevated PSA reading meant that a man had to endure painful biopsies and other side effect-prone procedures, then it would be easier to accept the argument that aging men might choose to remain ignorant about the status of their prostate gland.

The stark reality, however, is that a friendly early warning in the form of a higher-than-desired PSA level provides an aging male with the ability to adjust his lifestyle in a manner that may potentially reverse the course of the disease, and in the process, reduce his overall **mortality** risk.

It is difficult for most men (including me) to consistently follow healthy eating patterns. Yet in response to an early warning sign (such as rising PSA), men will often turn around their lifestyle for the better.

When men call ***Life Extension***® asking about a rising PSA blood level, we often suggest **comprehensive intervention** be implemented along with **active surveillance**.

The objective is to make healthy lifestyle choices and ingest compounds that help circumvent ***every*** route that enables tumor cells to propagate and escape confinement within the prostate gland.

My Personal Triumph

When I was **48** years old, my **PSA** blood reading jumped to **1.4 ng/mL**.

My reaction was nothing short of controlled panic. I had seen too many men's PSA level increase to over **1.0 ng/mL** and then steadily surge above **4.0 ng/mL** in just a few years. At that point, some of these men had metastatic disease, while others were cured but left with impotence, incontinence, and chronic pain from treatment.

I made a personal commitment of not letting a prostate malignancy get the better of me. My reaction was to treat this PSA reading of **1.4 ng/mL** as an early-warning sign that I had prostate cancer that required curative nontoxic treatment.

I adopted healthier dietary choices and initiated high doses of ***every*** nutrient and drug that had shown efficacy against prostate cancer. At age **61**, my PSA is a low **0.3 ng/mL**—a **79%** reduction from 12 years ago.

Despite having a family history of prostate cancer, I've been able to keep my PSA level low by following sensible (but by no means perfect) dietary patterns and ensuring that I don't miss taking nutrients, hormones, and drugs shown to reduce prostate cancer risk and reverse its progression.

PSA levels naturally rise with aging, yet there are a myriad of ways to control it. So far you've read mostly about **foods** that have been found to increase or decrease one's odds of contracting and dying from prostate cancer.

The sidebar on the next page provides a partial list of individual **nutrients** shown to lower PSA and/or reduce prostate cancer risk and progression.

Prostate Cancer Deaths *Sharply* Higher in United Kingdom

A British man diagnosed with prostate cancer is at least twice as likely to die of the disease as an American is. One study found men in the United Kingdom were **six times** more likely to die over a five-year period.[71,72]

There are a number of reasons for this, but the factor that most stands out is lack of national **PSA screening** in Britain compared to the United States.

Prostate cancer mortality (death) rates peaked in the early 1990s at almost identical rates in both countries until year **1994**, when PSA screening was launched in the United States but not in Britain.

Death rates from prostate cancer declined **four times** more in the United States compared to Britain in the years that coincided with higher PSA screening in the United States. Patients aged 75 or older

in the United States saw the largest and longest-lasting decline in mortality.[73,74]

These sharply higher prostate cancer death rates in Britain are even more striking when one realizes there are **five times** more men of **African** descent in the United States compared to Britain.

The incidence of prostate cancer in men of **African descent** is far higher, as is its aggressiveness. This means there should be a higher rate of Americans dying of prostate cancer than the British. Since the advent of widespread PSA testing, however, prostate cancer mortality has plummeted in the United States, but remained stubbornly high in Britain.

There are other factors causing so many more British men to perish from prostate cancer including a socialized medical system that often delays treating prostate cancer until painful bone metastasis develop. This is especially the case with elderly men who are most vulnerable to the adverse impact of rationed health care.

The sad reality, however, is that the failure of the British system relating to screening and early treatment results in **49%** of British prostate cancer victims dying within five years compared to less than **9%** in the United States.[72]

To put this in further perspective, prostate cancer is diagnosed in **47,300** men every year in Britain and there are around **10,800** deaths per year from the disease.[75] In the United States, about **180,000** men are diagnosed with prostate cancer (approximately **four times** as many) and only **26,120** die of it.[1] Based on a population ratio calculation, a far ***higher*** percentage of diagnosed British men die of prostate cancer compared to their American counterparts.

Nutrients That Interfere with Prostate Cancer Development and Progression

There are a number of mechanisms by which healthy prostate cells develop mutations that transform into malignancies that progress on to clinically relevant prostate cancer.

The good news is that many of the **nutrients** already used by health-conscious individuals have been shown to interfere with these oncogenic mechanisms as evidenced by an abundance of peer-reviewed published studies.

Some of these readily available **nutrients** include:

- **Cruciferous vegetables and/or extracts**[16-21]
- **Fish oil**[22-26]
- **Curcumin**[27-32]
- **Boswellia**[33-35]
- **Lycopene**[6,36-42]
- **Green tea**[43-47]
- **Lignans (from flax or Norway spruce)**[48-50]
- **Boron**[51-53]
- **Lutein**[6,54,55]
- **Gamma tocopherol**[56-58]
- **Zeaxanthin**[6,42,54,55]
- **Vitamin D**[59-65]

In addition to the nutrients listed above, concrete steps should be taken to activate **AMPK** enzyme activity in prostate cells in order to reduce their potential to transform into malignancy.[66-69] The antidiabetic drug **metformin** is now being studied as a potential prostate cancer therapy. Several nutrients that activate **AMPK** have demonstrated similar properties to metformin.[70]

Those with rising PSA levels should consider higher doses of nutrients and drugs that have demonstrated prostate protective effects and then test their PSA levels within three months.

The fact that there is a debate about the value of widespread **PSA screening** is ludicrous in light of these striking differences in survival rates between Britain and the United States.

Looming Prostate Cancer Epidemic

We are in the midst of a lifesaving technology going in reverse. The consequence will be thousands of needless deaths from metastatic **prostate cancer**.

Our **federal government** has taken a vehement stand against **PSA screening**. So much so that physicians may be financially **penalized** if they prescribe a **PSA blood test** to a healthy man.[87]

The initial results are that far fewer men are being diagnosed with prostate cancer.

This does not mean prostate cancer incidence is dropping. It only means that fewer ***early-stage*** curable and/or manageable prostate cancers are being detected.

The impact of this decrease in **PSA screening** will be an **explosion** of metastatic (advanced) prostate cancer cases in the coming years, just the way it was in the days preceding the introduction of the **PSA blood test**.

None of this has to happen. Newer imaging procedures, along with precision cryoablation techniques, can facilitate the diagnosis and eradication of early-stage prostate cancers. A fascinating article about a more advanced prostate cancer **treatment** option is described in this month's issue.

In cases of low-risk prostate cancer diagnosed early, men can be educated about diet, lifestyle changes, and ways to diminish exposure to factors that cancer depends upon for growth, invasion and metastasis. This method is best termed **proactive integrative care**.

This means that not every diagnosis of prostate cancer equates with surgery, radiation, or other forms of side-effect prone treatment.

Reawakening to Value of PSA Screening

Aging males have been lulled into a false sense of security when it comes to prostate cancer risk. They are hearing that annual PSA screening is no longer deemed necessary by our medical "authorities."

Despite this edict, low-cost PSA blood tests remain available to enlightened individuals. Those who understand how to rationally utilize

When Medical Technology Goes in Reverse

Most people think that innovation moves forward at a rational pace because the benefits are so obvious.

The reality is that new concepts in medicine are slow to gain acceptance and in some cases go in **reverse**! An average lag time from new concept to implementation is in the order of 10 to 20 years!

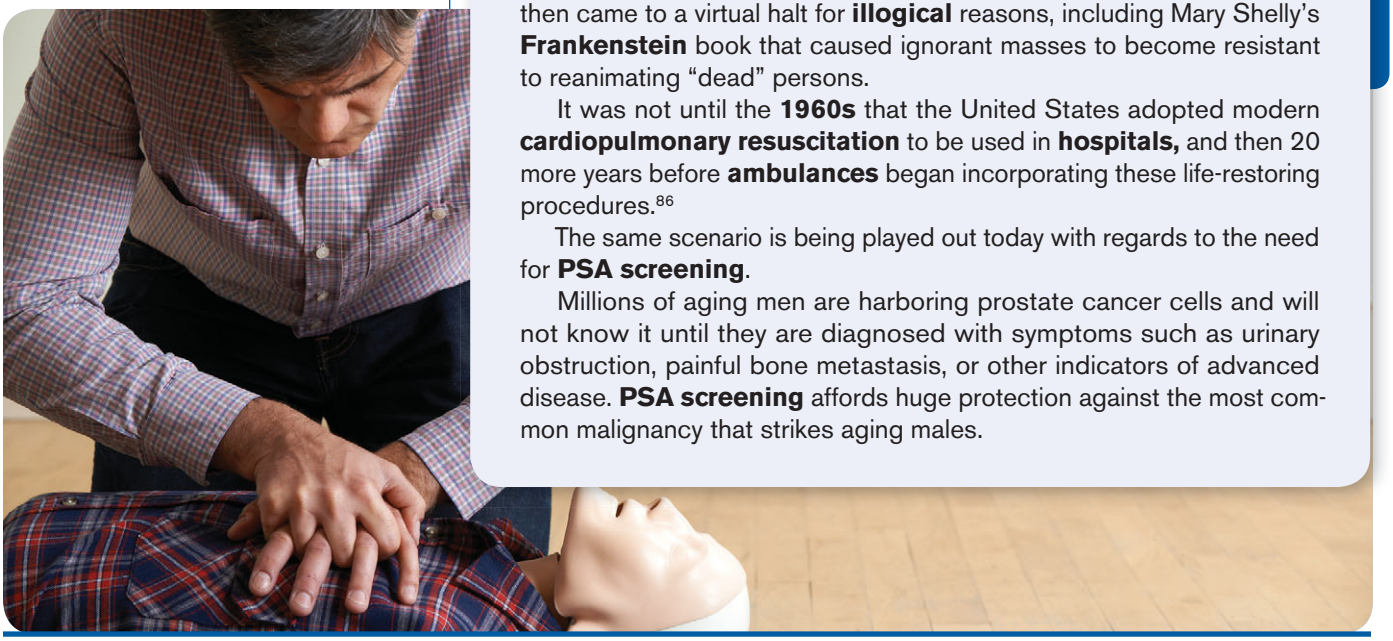
This happened with **cardiopulmonary resuscitation**. In **1767**, a few civic-minded citizens in **Amsterdam** discovered that drowned persons could be revived if manual **resuscitation** techniques were applied.

The technology of bringing dead people back to life spread rapidly, but then came to a virtual halt for **illogical** reasons, including Mary Shelly's **Frankenstein** book that caused ignorant masses to become resistant to reanimating "dead" persons.

It was not until the **1960s** that the United States adopted modern **cardiopulmonary resuscitation** to be used in **hospitals,** and then 20 more years before **ambulances** began incorporating these life-restoring procedures.[86]

The same scenario is being played out today with regards to the need for **PSA screening**.

Millions of aging men are harboring prostate cancer cells and will not know it until they are diagnosed with symptoms such as urinary obstruction, painful bone metastasis, or other indicators of advanced disease. **PSA screening** affords huge protection against the most common malignancy that strikes aging males.



the results can successfully intervene in response to any evidence of pathology uncovered by a PSA test.

Unlike most malignancies, prostate cancer is usually responsive to early- and later-stage interventions including lifestyle change and hormone modulation.

Improved rates of successful treatment of low-grade prostate cancers have led researchers at the **University of California-San Francisco** to conclude that prior arguments against widespread **PSA screening** are now less compelling.[88] More physicians today recognize that many early-stage prostate cancers ***don't*** require aggressive treatment to effectively manage the disease.

This was reinforced in articles published late last year in the ***Journal of the American Medical Association*** (November 17, 2015) showing that discontinuing PSA screening will result in a sharp increase in prostate cancer death rates that may not become symptomatically apparent until year **2022**.[89] These articles also describe improved methods of **active surveillance** in response to rising PSA levels.

What both sides **overlook** is that many **prostate cancers** are reversible in response to lifestyle changes and nontoxic approaches. This means that men can take charge now to reduce risk, even if they have not yet developed a clinically relevant prostate malignancy.

If a man with reversible disease is to initiate these natural approaches, he should first assess the health of his **prostate gland**, which is why annual **PSA** blood testing starting at age **40** is so critical. And if there is a family history of prostate cancer, as well as a family history of other cancers that increases a man's risk of prostate cancer, such as breast cancer and/or colorectal cancer, then the PSA testing should begin at age 35.

You have read in this article about human clinical findings showing robust reductions in prostate cancer risk and improved treatment outcomes in response to healthier living patterns. This indicates a logical recipe utilizing safe and natural approaches in response to a rising PSA level.

History of PSA Screening and Government Suppression

In **1992**, the **American Urological Association** and **American Cancer Society** recommended annual **PSA screening** for men 50 years and older.[76] As more men were screened, more prostate cancers were detected and successfully treated.[77-79]

This favorable trend was reversed when the **United States Preventive Services Task Force** recommended ***against*** PSA screening for all men, initially in 2008, and then again in **2011** and **2012**.[80] This decision was widely covered by the media, debated in the scientific literature,[81-85] and fiercely criticized by **Life Extension®**.

We at Life Extension® knew that failure to screen **PSA** levels would result in a return to the era when prostate cancer was usually diagnosed after it has metastasized.

The **federal government**, on the other hand, needs to pretend medical costs are lower in the short term, so they are aggressively seeking to deny men access to PSA blood tests, which will **defer** the costs of an epidemic of advanced prostate cancers that will manifest in the coming years.

Annual Blood Test Super Sale

Most Americans delay getting lab tests until after outward symptoms of serious disease develop.

The reasons for blood test deferrals include not knowing which tests to order, difficulty in finding a physician to prescribe proper blood tests, inability to access blood test results, and lack of affordability.

Life Extension® resolved these problems **20 years ago** by offering **comprehensive blood test panels** direct to health-conscious consumers at **low prices** with quick turnaround times, free access to health advisors to review results, and convenient drawing time usually with no appointment needed.

Every year on **April 1**, we announce our **Blood Test Super Sale** that slashes the price of our comprehensive panels by **50%**.

This annual event prompts health-conscious consumers to order our **Male** or **Female Blood Test Panels** to identify health problems in time to take corrective actions.

A description of these popular **blood test** panels appears on the next page. Our **Male Panel** includes the **PSA** test that we consider critical for all men over age 40.

To order these tests at savings of **50%**, call **1-800-208-3444**.

For longer life,

William Faloon

(Scientific references to this article begin on page 16.)

MALE AND FEMALE BLOOD TEST PANELS

Unlike commercial blood labs that test only a few risk factors, Life Extension®'s **Male** and **Female Blood Test Panels** measure a wide range of blood markers that predispose people to age-related diseases. Just look at the **huge** number of parameters included in the **Male** and **Female Blood Test Panels**:

MALE PANEL

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

CARDIAC MARKERS
C-Reactive Protein (high sensitivity)
Homocysteine

HORMONES
Free and Total Testosterone
DHEA-S
Estradiol (an estrogen)
TSH (thyroid function)
Vitamin D (25-hydroxyvitamin D)

METABOLIC PROFILE
Glucose
Kidney function tests: creatinine, BUN, uric acid, BUN/creatinine ratio
Liver function tests: AST, ALT, LDH, GGT, bilirubin, alkaline phosphatase
Blood minerals: calcium, potassium, phosphorus, sodium, chloride, iron
Blood proteins: albumin, globulin, total protein, albumin/globulin ratio
Hemoglobin A1c

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

CANCER MARKER
PSA (Prostate Specific Antigen)

FEMALE PANEL

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

CARDIAC MARKERS
C-Reactive Protein (high sensitivity)
Homocysteine

HORMONES
Progesterone
Estradiol (an estrogen)
Free and Total Testosterone
DHEA-S
TSH (thyroid function)
Vitamin D (25-hydroxyvitamin D)

METABOLIC PROFILE
Glucose
Kidney function tests: creatinine, BUN, uric acid, BUN/creatinine ratio
Liver function tests: AST, ALT, LDH, GGT, bilirubin, alkaline phosphatase
Blood minerals: calcium, potassium, phosphorus, sodium, chloride, iron
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COMPLETE BLOOD COUNT (CBC)
Red Blood Cell count including: hemoglobin, hematocrit, MCV, MCH, MCHC, RDW
White Blood Cell count including: lymphocytes, monocytes, eosinophils, neutrophils, basophils
Platelet count

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Blood testing services are available only in the continental United States and Anchorage, AK. Not available in Maryland. Restrictions apply for residents of MA, NY, NJ, RI, and PA.

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CAUTION: If you are taking anti-coagulant or anti-platelet medications, or have a bleeding disorder, consult your healthcare provider before taking this product.
Supportive but not conclusive research shows that consumption of EPA and DHA omega-3 fatty acids may reduce the risk of coronary heart disease.

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Note: Those taking anticoagulant drug Coumadin® (warfarin) should use Bone Restore without K2.

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Blood Test Predicts Second Stroke Risk

Scientists at the University of Virginia have linked high levels of **C-reactive protein** with an increased risk of ischemic **stroke**.*

C-reactive protein is produced in the liver in response to inflammation, and is currently measured to assess a person's risk of developing coronary artery disease. Life Extension® first drew a correlation between high C-reactive protein and stroke in the early 2000s.

Ischemic strokes, which are responsible for **85%** of all stroke cases, result from blockages that prevent blood flow to the brain. Stephen Williams, PhD, and colleagues wanted to determine how genes affect the levels of biomarkers such as C-reactive protein in blood. They discovered that not only did elevated C-reactive protein levels suggest an increased stroke risk, they identified gene variations that induce those risks.

"We have the genetics influencing C-reactive protein levels, which then increases the risk of having a recurrent stroke," said Williams. "Then we went back and said alright, can we predict the increased risk purely based on the genetics, which we were able to do.

"There is this shared genetic susceptibility not only for increased C-reactive protein but for increased risk for stroke. We could estimate what is called a hazard ratio—basically the increased risk for having or not having a second stroke—based on the genetics."

Editor's Note: Supplementing with an omega-3 product that includes krill and astaxanthin as well as an omega-7 product has been shown to decrease C-reactive protein by **44%**.

* *Neurology.* 2016 Jan 26;86(4):351-9.

Increased B Vitamin Intake Associated with Lower Pancreatic Cancer Risk

Pancreatic cancer kills **40,000** Americans each year. **Life Extension Foundation** is funding a clinical trial at the **City of Hope Hospital** in Southern California with the objective of improving survival in advanced **pancreatic cancer** patients.

There is an urgent need for people to reduce risk factors involved in pancreatic carcinogenesis. Encouraging news has arrived in a study showing markedly lower pancreatic cancer rates in those with higher intakes of common **dietary supplements**.

Researchers from the University of Pittsburgh have uncovered an association between an increase in the intake of vitamin B6 and choline and a lower risk of cancer of the pancreas. The findings were reported in *Cancer Epidemiology, Biomarkers & Prevention*.*

J. Huang and colleagues utilized data from the Singapore Chinese Health database that enrolled 63,257 men and women between 1993 and 1998. Dietary questionnaire responses provided information on the intake of individual nutrients, which include vitamins B6, choline, and other nutrients. Over an average of **16.3 years** of follow-up, 271 pancreatic cancer cases were identified.

Among subjects whose intake of vitamin B6 was among the top **20%** of participants, there was a **48%** lower risk of developing pancreatic cancer in comparison with those whose intake was among the lowest **20%**. For those whose choline intake was highest, the risk of pancreatic cancer was **33%** lower.

Editor's Note: As possible cancer-protective mechanisms for vitamin B6, the authors cite its role as a co-factor for enzymes involved in DNA synthesis and methylation pathways of one-carbon metabolism, as well as an ability to protect DNA from oxidative damage. In regard to choline, its role as a methyl donor may also help protect against pancreatic carcinogenesis.

* *Cancer Epidemiol Biomark Prev.* 2015 Dec 28.

Blueberries Show Promise for Cognitive Impairment

The 251st National Meeting & Exposition of the American Chemical Society was the site of a presentation concerning improved cognitive function in association with blueberry consumption among individuals with mild cognitive impairment.*

Robert Krikorian, PhD, presented the results of two studies concerning the effects of blueberries in older adults. In the first study, 47 participants with mild cognitive impairment were given the freeze-dried powder equivalent of a cup of fresh blueberries or a placebo daily for 16 weeks. "There was improvement in cognitive performance and brain function in those who had the **blueberry powder** compared with those who took the placebo," Dr. Krikorian reported.

In the second study, 94 participants with subjective memory complaints received blueberry powder, fish oil, fish oil plus blueberry powder, or a placebo. While improvement in cognition occurred in association with blueberry or fish oil, Dr. Krikorian noted that "the results were not as robust as with the first study."

Editor's Note: Dr. Krikorian suggested that the second study's smaller effects could be attributable to less severe symptoms among its subjects compared to those in the first study. Blueberries may be more effective for those diagnosed with cognitive impairment rather than those with minor memory complaints.

* National Meeting & Exposition of the American Chemical Society. March 13-17, 2016.

Baldness Linked to Prostate Cancer Death

A new study published in *American Journal of Epidemiology* found that male pattern baldness is linked not only to a higher risk of developing prostate cancer but also with a higher risk of prostate cancer death.[1]

Researchers analyzed data on 4,316 men aged 25 to 74 years old who had not been diagnosed with cancer before the study started. To date, there have been 3,284 deaths, 107 from prostate cancer.

Researchers found the risk for death from prostate cancer was **56%** higher in men with any baldness than in those with no baldness. In men with moderate balding, the risk was **83%** higher.

Although more research is needed, testosterone may be the link between the two. Dihydrotestosterone (DHT) is a male hormone produced from testosterone by an enzyme called 5-alpha-reductase. Dihydrotestosterone is linked with both the growth of prostate cells and baldness in older men.

Please note that higher **testosterone** itself has not been shown to increase prostate cancer risk. In fact, men with lower levels of **testosterone** have ***greater*** risks of aggressive prostate malignancies.[2-5] From what is known today, aging men should seek to reduce their levels of dihydrotestosterone while maintaining their **testosterone** in youthful ranges.

Two medications that reduce dihydrotestosterone levels, Proscar® (finasteride) and Avodart® (dutasteride), have been shown in studies to reduce the risk of prostate cancer and reduce prostate gland volume by **17%** to **25%** in a relatively short period of time.

Editor's Note: Baldness is not a certain risk factor for prostate cancer, says researcher Michael Cook, PhD, of the National Cancer Institute, despite the findings. But, he adds: "It is conceivable that, in the future, patterns and degree of male baldness may play a small role in estimating risk of prostate cancer."

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Urgent Need to Test Blood of Younger People

Scientific studies validate the urgent need for everyone to have their blood tested for cholesterol, triglycerides, glucose, calcium, and other cardiac risk factors no later than age 18.

A study published in the *Annals of Internal Medicine* looked at a large group whose blood was initially tested between ages 18 to 30.* Seven additional blood tests were done on each person over a 20-year period. The results showed that those with the highest LDL (over **160 mg/dL**) were **5.6 times** more likely to have calcium buildup in their coronary arteries by age 45.

LDL (low-density lipoprotein) transports cholesterol from the liver throughout the vascular system. In the presence of excess LDL, too much cholesterol saturates the blood and contributes to arterial occlusion.

Editor's Note: This study showed that over a 20-year period, those with even moderately elevated LDL (**100-129 mg/dL**) were **2.4 times** more likely to have coronary calcification.

**Annals Inter Med.* 2010 Aug 3;153(3);137-46.

Magnesium Linked with Reduced Diabetes Risk

The results of a meta-analysis published in *Biomedical and Environmental Sciences* add more evidence in support of a relationship between higher magnesium intake and a lower risk of developing type II diabetes.*

Researchers at China's Nantong University selected 15 articles that reported the results of 19 prospective studies examining the effect of dietary or dietary plus supplemental magnesium on type II diabetes incidence among a total of 539,735 men and women. Type II diabetes developed in 25,252 subjects over follow-up periods that ranged from four to 20 years.

When highest versus lowest magnesium intake for each study was compared, high intake was associated with a **23%** lower diabetes risk. A **100 mg** per day increase in the mineral was associated with an average **16%** risk reduction.

Editor's Note: Authors Tian Xu and colleagues note that intervention trials have shown that magnesium supplementation improved insulin sensitivity and reduced insulin resistance and plasma fasting glucose levels in diabetics as well as nondiabetics.

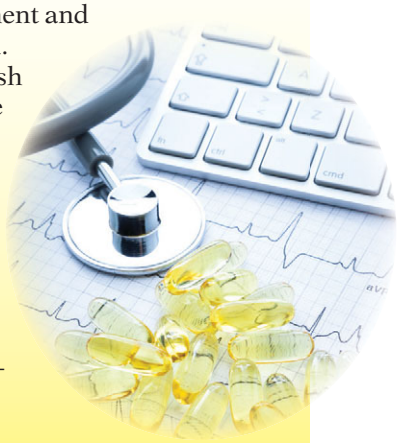
* *Biomed Environ Sci.* 2015 Jul;28(7): 527-34.

Fish Oil and Vitamin B12 Reduce Plasma Homocysteine

The September 2015 issue of *Asia Pacific Journal of Clinical Nutrition* published the finding of researchers at Zhejiang University in China of a reduction in plasma homocysteine levels following supplementation with vitamin B12 and/or fish oil.*

Thirty men and women were randomly assigned to receive **1,000 micrograms** vitamin B12, **2 grams** fish oil, or **2 grams** fish oil plus **1,000 micrograms** vitamin B12. Plasma vitamin B12, lipids, ferritin (a biomarker of iron status), **C-reactive protein**, **homocysteine**, and other factors were measured before treatment and after four and eight weeks of supplementation.

Among those who received fish oil alone or fish oil plus vitamin B12, triglycerides, C-reactive protein and ferritin significantly decreased after four and eight weeks. Homocysteine was lowered by **22%** in the vitamin B12 group, **19%** in the fish oil group, and **39%** among those who received both supplements for eight weeks.



Editor's Note: Homocysteine is an amino acid made from methionine that inflicts damage to the inner arterial lining (endothelium) and increases the risk of cardiovascular disease and other conditions.

**Asia Pac J Clin Nutr*. 2015;24(3):403-11.

Higher Serum Magnesium Levels Linked with Lower Risk of Heart Disease and Sudden Cardiac Death

A study reported in the *Journal of the American Heart Association* uncovered an association between higher magnesium levels and a decreased risk of coronary heart disease and sudden cardiac death over a median follow-up of 8.7 years.*

For their research, Brenda Kieboom, MD, and colleagues at Erasmus MC–University Medical Center in The Netherlands evaluated data from 9,820 participants in the Rotterdam Study of men and women aged 55 and older. Among 2,303 deaths over follow-up, 780 were attributed to cardiovascular disease, among which 431 were classified as coronary heart disease deaths, including 187 sudden cardiac deaths.

For subjects whose serum magnesium was categorized as low, there was a **36%** higher risk of coronary heart disease mortality and a **54%** greater risk of sudden cardiac death in comparison with those who had levels in the middle range.

Editor's Note: "The results from this and previous studies may provide a rationale to design intervention studies to analyze whether magnesium supplementation could prove to be effective in lowering the burden of coronary heart disease mortality and sudden cardiac death," the authors said.

* *J Am Heart Assoc*. 2016 Jan 22.

Research Suggests Prenatal Carnitine Supplementation Could Help Prevent Some Cases of Autism

An article in *Cell Reports* reveals the finding of a potential role for carnitine as a prenatal supplement to protect against autism in unborn children.*

Carnitine, found in meat and other foods, is also manufactured in the body from the amino acid lysine. Research has shown that inherited mutations in a gene (TMLHE) required for carnitine synthesis are associated with development of autism spectrum disorders, yet the mechanism supporting the relationship had not been established.

By utilizing technology that allows tracking of individual neural stem cells in a developing brain, Zhigang Xie, PhD, and colleagues observed that cells that fail to produce carnitine are depleted. However, this phenomenon is prevented when the neural stem cells are supplied with carnitine.

"Here we have indications, at least for some types of autism risk, that a dietary carnitine prevention method might be effective," Dr. Xie stated.

Editor's Note: "We suggest that genetic screening of prospective parents for TMLHE mutations, coupled with inclusion of carnitine as a dietary supplement upon initial diagnosis of pregnancy, promises mental health benefits for newborns otherwise at significant risk for developmental brain disorders," the authors conclude.

**Cell Reports*. 2016 Jan 28.

Vitamin D3 Lowers Inflammatory T Cells in Multiple Sclerosis Patients

Results from a study reported in the journal *Neurology* suggest a benefit for treatment with high-dose **vitamin D** for people diagnosed with multiple sclerosis.*

Peter A. Calabresi, MD, and colleagues tested the effects of vitamin D supplementation in a study involving 40 relapsing-remitting multiple sclerosis patients. Participants were treated for six months with **10,400 IU** or **800 IU** vitamin D. Serum levels of 25-hydroxyvitamin D were measured at the beginning of the study and at three and six months.

Subjects who received the ***higher*** dose of vitamin D experienced an average **34.9 ng/mL** increase in serum vitamin D by the end of the study, while levels increased by just **6.9 ng/mL** in the low-dose group. Among those who received the higher dose, the proportion of pro-inflammatory interleukin 17 (IL-17) producing cells decreased, suggesting a reduction in disease severity.

Editor's Note: "These results are exciting, as vitamin D has the potential to be an inexpensive, safe, and convenient treatment for people with MS," stated Dr. Calabresi, the director of the Johns Hopkins Multiple Sclerosis Center. "We hope that these changes in inflammatory T cell responses translate to a reduced severity of disease. Other clinical trials are underway to determine if that is the case."

**Neurology.* 2015 Dec 30.

Meta-Analysis Adds Evidence to Antidepressant Effect of Omega-3

An article reported in *Translational Psychiatry* adds more evidence to the association between higher omega-3 fatty acid intake and a lower risk of major depressive disorder (MDD).*

Roel J. T. Mocking and colleagues selected 13 trials that included 1,233 subjects for their analysis. Studies were restricted to randomized placebo-controlled trials of adults diagnosed with major depressive disorder, excluding major depressive disorder secondary to other neuropsychiatric disorders, and perinatal and perimenopausal major depressive disorder.

Compared to placebo, omega-3 fatty acid intake was associated with beneficial effects, particularly among participants who were using antidepressant drugs or who received higher doses of the omega-3 fatty acid eicosapentaenoic acid (EPA). The authors suggest that omega-3's antidepressant effect is the result of anti-inflammatory characteristics of EPA's metabolic byproducts. "Future precision/personalized medicine trials should establish whether possible interactions between EPA and antidepressants could provide targets to improve antidepressant response and its prediction," the authors conclude.

Editor's Note: "Omega-3 supplements may be specifically effective in the form of EPA in depressed patients using antidepressants," stated lead author Dr. Mocking. "This could be a next step to personalizing the treatment for depression and other disorders."

**Translat Psychiatry.* 2016 Mar 15.

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MAGNESIUM
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Magnesium is the **most important** mineral in the body, yet most Americans do not obtain sufficient magnesium from their diet.

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

References

1. *Am J Clin Nutr.* 1987;45:1305-12.
2. *Clinica Chimica Acta.* 2000;294:1-26.

Magnesium Caps

Item #01459 • 100 vegetarian capsules

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WITH UNIQUE DUAL ENCAPSULATION TECHNOLOGY

Scientists are increasingly discovering that probiotics impact the health of the entire body.[1-6] Unfortunately, most commercial probiotics are destroyed by the stomach's natural digestive acids before they reach their destination.[7]

FLORASSIST® Balance with "**dual encapsulation**" technology delivers maximum probiotic protection to your small intestines.

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- Has ***dual encapsulation*** *technology*, which keeps the capsule intact longer and ensures that the probiotic reaches the small intestine
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FLORASSIST® Balance contains the following bacterial strains:

1. Lactobacillus acidophilus LA-14 *2. Lactobacillus rhamnosus LR-32*
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These potent strains of probiotic bacteria adhere to the soft lining of the intestinal tract to help maintain a healthy surface and aid in support for the digestive system.

+ Colony forming units at time of manufacture.

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Maintaining optimal **vitamin B** status becomes critical as we age.

B vitamins must be replenished *daily* because they are water soluble and easily depleted from the body. Stress,[1] alcoholic beverages,[2] and some medications[3] can quickly deplete B vitamins.

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BioActive Complete B-Complex provides *enzymatically active* forms of meaningful potencies of each B vitamin. This includes the ***pyridoxal 5'-phosphate*** form of vitamin B6 (the metabolically active form, shown to protect lipids and proteins against **glycation** reactions) *and* the most biologically active form of **folate** called ***5-methyltetrahydrofolate* (5-MTHF)**, which is up to **7 times** more bioavailable than folic acid and requires no enzymatic conversion to become metabolically active.[4]

BioActive Complete B-Complex
Item #01945 • 60 vegetarian capsules

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1 bottle	$12	**$9**
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Non-GMO

References
1. *Hum Psychopharmacol.* 2011;26(7):470-6.
2. *Eur J Clin Nutr.* 2004;58(11):1518-24.
3. *Curr Concepts Nutr.* 1983;12:1-12.
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To order **BioActive Complete B-Complex**, call **1-800-544-4440** or visit **www.LifeExtension.com**

BY KATHY RAMIREZ

Oral Sunscreen *Reduces* Skin Cancer Risk

In a recent advance, researchers showed that a vitamin B nutrient called **nicotinamide** can reduce the risk of skin cancer by **23%**![1] This is a rate of protection unparalleled by ***any*** known compound.

What researchers have confirmed is **nicotinamide** plays a significant role in producing **ATP**, which facilitates **DNA repair** in skin cells damaged by solar radiation.[2] Rapidly restoring sun-damaged DNA provides powerful protection against malignant transformation.

When combined with two other natural ingredients, the protection from harmful **solar rays** is expanded as these tropical **plant extracts** defend against sun damage and further promote **DNA repair**.[3-7]

This discovery is timely and important since skin cancer is now the most common form of malignancy in the United States, affecting over **3 million** Americans each year.[8-11]

It is now possible to prevent DNA damage, promote DNA repair, and impede ultraviolet radiation immune suppression by taking **oral** nutrients.[2,3,12,13]

This discovery can help reduce the epidemic of **skin cancers** that impact a greater number of individuals each year.

Skin Cancer Surgery How To Reduce Scarring and Pain

The vast majority of skin cancers are not fatal. They all require treatment by a qualified physician and the earlier skin cancer is diagnosed and treated, the better the outcome.

The two most common non-melanoma skin cancers are basal cell and squamous cell. Basal cell skin cancer can be locally aggressive if neglected, but usually does not metastasize. Squamous cell skin cancer is typically slow growing, but does have the potential to metastasize, especially if neglected.

Various non-surgical treatment regimens for non-melanoma skin cancer include topical chemotherapy, cryotherapy, photodynamic therapy, and cutaneous surgery.

Mohs micrographic surgery is a specialized type of skin cancer surgery useful for both non-melanoma skin cancer as well as melanoma skin cancer. ***Mohs micrographic surgery*** is performed by a dermatologic surgeon trained in this technique. The Mohs surgeon painstakingly excises thin layers of tissue, examining tissue margins for evidence of cancer after each successive round of tissue removal. The Mohs technique offers the highest rate of cure, with the best chance of tissue preservation.

For primary **melanoma** lesions between **1 mm** and **4 mm** in thickness, sentinel node biopsy is strongly suggested. If melanoma cells are not detected in the **sentinel node** (the lymph node most likely to drain from the primary lesion), then the adjacent lymph nodes are unlikely to be involved and no further surgery is necessary. If the sentinel node does reveal melanoma, then the adjacent nodes are usually removed in what is called a complete node dissection, because of the risk of metastatic melanoma in these lymph nodes.

If left untreated, any type of skin cancer can potentially cause localized damage and tissue destruction, as well as death (e.g. metastatic malignant melanoma).

Prevention and early evaluation of suspicious skin lesions are critical to avoiding potential surgical scarring and tissue mutilation caused by skin cancers left untreated over time. Once any form of **skin cancer** grows too large, extensive surgery is required that can produce tissue mutilation and post-surgical pain.

The Sun and Skin Cancer Connection

Ultraviolet radiation from sunlight is the primary cause of skin cancers of all kinds. In fact, sunlight and ultraviolet radiation are considered "complete carcinogens" for **squamous cell carcinoma** and its precursor, **actinic keratosis**. This means that no other initiating factor is required to produce these conditions.[14]

It is now clear that excessive ultraviolet exposure is associated with **65%** of cases of **malignant melanoma**, the deadliest skin cancer, and **90%** of non-melanoma skin cancers (squamous and basal cell carcinomas).[15] According to the American Cancer Society, it is estimated that in 2016 more than **13,000** deaths will occur from different types of skin cancer.[16] Nearly **5 million** Americans are treated with skin cancer annually, accounting for over **$8.1 billion** in health care expenditures.[10]

The number of sunburns a person experiences increases the chances of getting one of these cancers.[14]

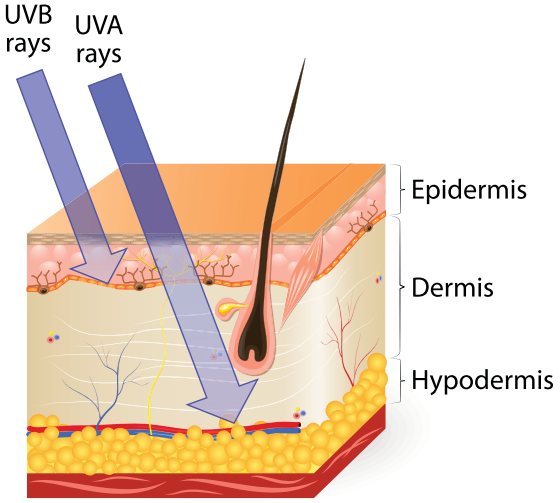
How Solar Ultraviolet Radiation Causes Cancer

So why is ultraviolet radiation so dangerous?

As sunlight reaches the earth and ultraviolet radiation strikes the human skin, changes characterized by the formation of cancer-producing compounds trigger DNA mutations.[17-19]

Our bodies have multiple **repair systems** that can remove the damaged portions of DNA and **restore**

Ultraviolet Radiation Penetration into the Layers of Skin



their normal sequence.[20,21] To be effective, these repair systems require a steady and ample supply of *adenosine triphosphate* (ATP),[20] the energy-releasing molecule that fuels all cells to power their intracellular machinery.

Unfortunately, supplies of ATP tend to decrease with age, a problem that is compounded by the fact that ultraviolet radiation itself inhibits the production of ATP.[17,22]

Insufficient ATP supplies means inefficient **DNA repair**. In other words, ultraviolet-exposed skin cells are not only at increased risk of DNA damage, but they are also **impeded** in their attempts to repair that damage before it triggers malignant transformation.[2,17]

Further complicating matters, even small doses of ultraviolet radiation suppress the immune system in the skin, reducing the body's ability to identify and destroy potentially malignant cells before they go rogue.[13,17,23-25]

The good news is that studies show that promoting rapid DNA repair is an effective means of preventing malignant transformation in skin cells.[24,26]

Even better, science has identified **three specific nutrients** that work together to provide protection from the ill effects of solar radiation. Together, **nicotinamide**, **red orange extract**, and ***Polypodium leucotomos*** extract help prevent DNA damage, promote DNA repair, reverse immune suppression, and reduce the twin threats of oxidation and inflammation that arise from ultraviolet exposure.[2,3,12,13]

Nicotinamide Protects against Skin Cancer

Nicotinamide (vitamin B3) is a safe vitamin that had shown promise in lab and animals studies in preventing skin cancers, especially the most common, non-melanoma variety.[12] In addition, studies in heavily sun-damaged people show that nicotinamide provides protection from precancerous **actinic keratosis**, as well as from new **non-melanoma** skin cancers.[2]

In the most compelling and important study to date, researchers enrolled 386 healthy subjects with a history of at least two non-melanoma skin cancers in the past five years. Subjects received either twice-daily nicotinamide (**500 mg** per dose) or placebo for 12 months.[1]

The researchers were stunned at the results. At 12 months, the rate of new non-melanoma skin cancers was significantly reduced by **23%** in supplemented subjects compared to the placebo group.[1] It is almost unheard of for any single biological intervention to reduce the rate of cancer in people at risk by a figure as high as **23%** overall.

What You Need to Know

Oral Sunscreen Protects against Skin Cancer

- **Skin cancer is the most common and most preventable cancer in American adults.**
- **The rate of skin cancer is rising as more and more people embrace the outdoors and experience greater exposure to sunlight.**
- **Topical sunscreens are useful and effective at skin cancer prevention, but most people apply them too lightly and inconsistently.**
- **Scientists have now identified a common intracellular substance, nicotinamide, that can reduce rates of skin cancer by up to 23% overall when taken as an oral supplement.**
- **Nicotinamide boosts energy levels in cells, allowing them to repair their own DNA following ultraviolet light-induced damage, thereby reducing the risks of skin cancer.**
- **Nicotinamide also promotes immune system functions that are damaged by ultraviolet radiation, resulting in improved surveillance and destruction of emerging cancers.**
- **Red orange extract and *Polypodium leucotomos* extract serve as important adjuvants to nicotinamide, providing protection against reactive chemicals generated by ultraviolet light and reducing the resulting inflammation that can promote cancer.**
- **Topical sun protection along with the use of this nutrient combination should be part of a daily routine for a regular, year-round protection against the inevitable exposure to ultraviolet light.**

When the carcinomas were broken down by tumor type, supplemented subjects had **20%** fewer new diagnoses of basal cell carcinomas and **30%** fewer new diagnoses of squamous cell carcinomas.[1]

In addition, supplemented individuals had an **11%** reduction in the rate of new premalignant actinic keratoses three months into the study. That reduction was **13%** at 12 months. Once supplementation was discontinued, however, no evidence of further benefit was seen. This lets us know the importance of continuous **oral** intake of **nicotinamide**, an inexpensive B vitamin that does not cause skin flushing.[1]

How Nicotinamide Works

What makes nicotinamide so powerful against skin cancer?

The answer lies in two of nicotinamide's most fundamental properties: its role in producing **ATP** and its ability to protect against ultraviolet-induced **immunosuppression**.[2]

As stated earlier, the body relies on an ample supply of ATP to **repair** and remove the damaged portions of DNA and **restore** their normal sequence. By helping the body produce more ATP, **nicotinamide** helps to ensure continuous and efficient **DNA repair** mechanisms. In fact, nicotinamide has been shown to repair ultraviolet-induced DNA damage in two ways, making it extremely effective.[2,12]

In a cell culture experiment, researchers treated skin cells with nicotinamide and then exposed them to low-dose simulated solar ultraviolet radiation. The nicotinamide treatment significantly increased the number of cells undergoing **DNA repair**. It accomplished this by removing and replacing damaged DNA and by increasing the repair *rate* in each cell.[2]

In a second portion of the experiment, researchers measured the production of molecular products of DNA damage within cells, which is another means of mea-

Types of Skin Cancers

"Skin cancer" is a general term comprising several rather different types of malignancy. Like all organs, the skin contains a variety of cell types with differing functions, and several of those cell types produce readily recognized malignancies.

The most deadly, but fortunately least common, of the skin cancers is malignant **melanoma**.[31] Two main types of skin cancers collectively referred to as "non-melanoma skin cancers" are discussed along with one precancerous lesion:[31,32]

- **Basal cell carcinoma** is the most common human skin cancer, arising from the deeper (basal) skin layers that produce the protein keratin.
- Basal cell carcinomas represent about **80%** of skin cancers.
- They are most common in sun-exposed areas of skin, and, while once more common in middle-aged or older adults (whose lifetime exposure is higher), they now occur with increasing frequency in younger adults, presumably because of our sun-worshiping culture.
- **Squamous cell carcinoma** is the second most common skin cancer. It arises from flat (squamous) cells in the outer skin layer.
- These represent about **20%** of skin cancers found in sun-exposed areas but also in scars or chronic skin sores.
- Though metastatic or local invasion is unusual, squamous cell carcinomas spread by these means more commonly than do basal cell cancers.
- **Actinic (or solar) keratoses** are precancerous lesions produced by excessive sun exposure. These are small, rough/scaly lesions, most commonly seen on sun-exposed facial skin, though they can be found elsewhere.
- Though most remain benign (and some regress on their own), some actinic keratoses go on to produce squamous cell carcinomas, making them worth monitoring or removing.

All of these cancers and precancerous lesions result largely from excessive sun exposure, and can be prevented by taking steps to protect oneself from the DNA-damaging, immune-suppressing effects of solar ultraviolet light.

suring DNA damage and repair. They found that nicotinamide reduced the concentration of those marker molecules both in cells in culture and in human skin.[2]

A similar cell culture study using *melanocytes* (pigmented skin cells that can develop into deadly melanomas) showed virtually identical results. Nicotinamide treatment led to a reduction in markers of DNA damage and enhanced evidence of DNA repair.[12]

Immune Support

We learned earlier that ultraviolet radiation suppresses the immune system in the skin, which reduces the body's natural ability to identify and destroy potentially malignant cells. Ultraviolet radiation is so effective at suppressing the immune system that it is used in certain patients with severe autoimmune disorders to turn down their overactive immune system.

Human studies show that **nicotinamide** protects against ultraviolet-induced **immune suppression**.

In one such study, healthy volunteers took either a placebo or nicotinamide at doses of **500** or **1,500 mg** daily for one week. On the third day after supplementation, subjects underwent low-dose irradiation of distinct areas of their back for three days, at three fixed doses.[13]

As expected, the placebo recipients showed substantial *immunosuppression* of skin in the irradiated areas. When compared to placebo groups, subjects taking either dose of nicotinamide showed significant reductions of **50%** to **66%** (depending on radiation dose), with no effects seen in unirradiated skin. It is important to note that all subjects tolerated the supplement well and that the low dose (**500 mg**) of nicotinamide delivered similar immune protection as the high dose (**1,500 mg**).[13]

The Problem with Topical Sunscreens

Skin cancers affect over 3 million Americans each year, killing tens of thousands. These shocking numbers continue to climb with each passing year.[8-11]

Clearly, despite aggressive public education campaigns, Americans remain unable to protect themselves sufficiently from the cancer-inducing effects of solar radiation. That's not to say that taking protective measures such as wearing a hat, covering up, seeking shade, and wearing topical sunscreens aren't important. They are.

Unfortunately, most **topical sunscreens** have other limitations. They only block a portion of ultraviolet radiation from reaching the skin, they often break down under solar radiation (which reduces their effectiveness), and their content of free radical scavengers is woefully inadequate to deal with the intense release of oxygen free radicals deep within in skin exposed to ultraviolet light.[26]

That's what makes the development of an **oral sunscreen** so revolutionary.

By avoiding the pitfalls of most topical sunscreens, oral sunscreens add a tremendous convenience factor that is likely to enhance people's willingness to use sun protection. In this way, daily oral sun protection can become routine, just like taking other supplements.

If thought of as **cancer prevention**, rather than simply sunburn protection, most people will take this regimen more seriously than they do topical sunscreens. The result will be more broad-spectrum protection against the negative effects of the sun—and likely a reduction in the risk of skin cancers.

Red Orange Extract for DNA Protection

Recent laboratory studies have demonstrated that **red orange extract** adds to nicotinamide's DNA-protective, immune-boosting effects.

Red orange extract is a powder obtained by a patented process from three pigmented varieties of *Citrus sinensis*. This extract is rich in anthocyanins, flavanones, and hydroxycinnamic acids. All of these nutrients have been found to enhance the body's natural ability to protect itself against ultraviolet radiation.[3-6] These biomolecules also offer protection from the inflammation[3,6] and oxidative stress caused by ultraviolet radiation.[4]

In one study, red orange extract has been clinically shown to reduce the intensity of sunburn by about **35%** after 15 days of treatment.[27] This demonstrated the ability of red orange extract to prevent skin damage and potentially reduce skin cancer risk. The ability to reduce the intensity of a sunburn is an important finding, given the close correlation between the number of lifetime sunburns and the risk of developing skin cancers.[14]

Let's take a look at a few of the studies that show these benefits.

In one study, when human skin cells (keratinocytes) were exposed to ultraviolet radiation, the application of red orange extract reduced ultraviolet-induced cell damage, helped prevent inflammation, and reduced cell death in response to ultraviolet radiation.[5]

Similar results were found in human cultured skin cells (keratinocytes and fibroblasts) exposed to powerful oxidants, demonstrating the ability of red orange extract to reduce oxidant stress.[28]

Polypodium Leucotomos Extract Protects against Ultraviolet Radiation

Polypodium leucotomos extract is obtained from a tropical fern, which has a long history as a treatment for psoriasis and other inflammatory skin conditions.[7,29] The extract is rich in polyphenols that potently inhibit oxidant stress and inflammation, while also protecting skin cells against ultraviolet radiation.[7]

In a study of 10 healthy volunteers aged 29 to 54, researchers randomly assigned patients to receive two **240 mg** doses of *Polypodium leucotomos* extract or a placebo prior to exposing them to a dose of ultraviolet radiation, then took skin biopsies.[7] At a lower dose of ultraviolet light, placebo subjects had a dangerous increase in a marker of DNA damage (called the "common deletion") by **217%**. Subjects in the supplemented group had a decrease in the marker of **84%**. At a higher level of ultraviolet exposure, DNA damage increased by **760%** in placebo subjects, while increasing only **61%** in the supplemented group.

The impact of these results was seen in a human study in which subjects were given *Polypodium leucotomos* extract twice daily for 15 days. The researchers found that the subjects could tolerate a significantly ***larger dose*** of ultraviolet light before showing skin redness (a marker of exposure/damage) compared with their ultraviolet tolerance prior to supplementation. Subjects also recovered faster from ultraviolet-induced inflammation.[30]

Summary

In a remarkable development, scientists have discovered that **nicotinamide**, a well-known natural supplement and essential cellular component, can reduce the rate of new skin cancers by **23%** following oral supplementation.

Nicotinamide appears to exert its beneficial efforts primarily through prevention of DNA damage and promotion of DNA repair, two early processes that can stop cancer initiation.

Two additional natural ingredients, **red orange extract** and ***Polypodium leucotomos* extract**, offer complementary benefits, providing protection against the reactive chemical compounds produced inside cells when exposed to ultraviolet radiation. These extracts also help to suppress the inflammatory response to radiation exposure, which is known to contribute to cancer progression.

What few people realize is that everyday exposure to solar rays causes cumulative DNA damage, accelerates skin aging, and increases skin cancer risk.

The advent of three natural compounds provides an **oral sun protection formula** that can be used daily to protect skin from routine solar exposure. These nutrients also complement any topical creams or lotions by protecting even hard-to-reach area of one's skin.

Daily supplementation should provide a strong baseline of protection against the sun's ill effects. However, when prolonged exposure to the sun is planned, the usual recommendations for sun protection still apply in order to provide maximum skin cancer-preventive effects. ●

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

Photodynamic Therapy

Nicotinamide has been shown to powerfully prevent ultraviolet-induced immunosuppression. This makes it especially valuable in patients undergoing **photodynamic therapy**.[33]

In this treatment for non-melanoma skin cancers, visible light is used in combination with chemical photosensitizers in an effort to specifically target skin cells affected by the cancer. Unfortunately, up to **45%** of people treated with this approach have resistant or recurrent tumors that are directly related to the light-induced immune suppression in the area of irradiation.[33,34]

This makes photodynamic therapy a double-edged sword, since it potentially condemns nearly half of its recipients to further battles with malignancy. This presents an ideal scenario for the use of nicotinamide—and in fact, one study has already proven its benefits.

Subjects in this study received a placebo or **500 mg** of nicotinamide twice a day for seven days.[33] On day three, subjects received photodynamic therapy to discrete areas of the back, while adjacent, non-irradiated areas served as control patches. Immunosuppression in the skin was determined by injection of a known antigen to which volunteers were all sensitive, and to which they were expected to produce a reaction in the skin. (Skin redness as well as the diameter of the reaction were measured.)

Subjects receiving the placebo showed **50%** suppression of the skin reaction, as expected. But in those receiving nicotinamide, the immunosuppression was itself reduced, resulting in **66%** less redness and a **90%** reduction in diameter of the reaction site. A similar group of subjects received nicotinamide cream or a placebo cream, and again, immunosuppression was reduced in treated subjects by **59%** compared with placebo.

This study powerfully demonstrates nicotinamide's ability to combat immunosuppression and support the immune system's ability to detect and destroy developing cancers.

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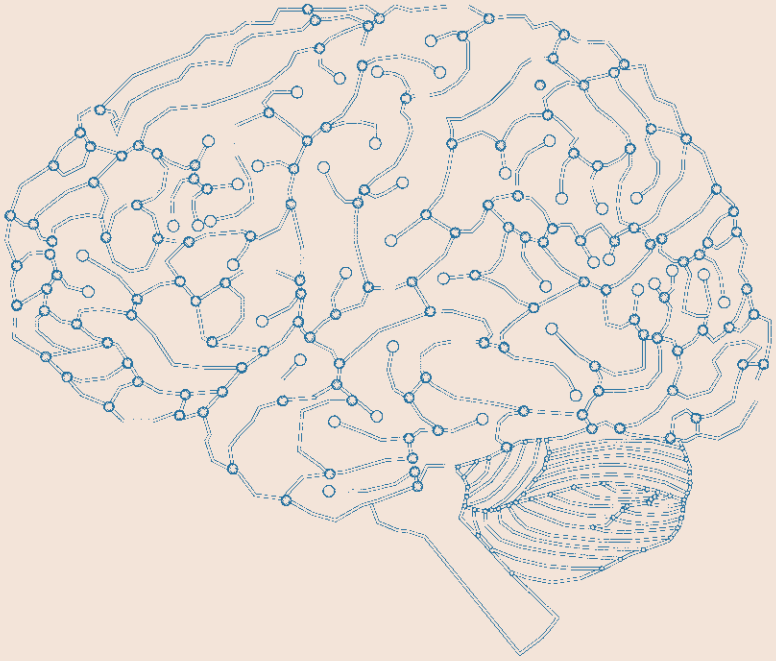


Unique MAGNESIUM Compound *Reverses* Brain Aging

BY JAMIE RIVINGTON

Scientists have been surprised by the discovery that **magnesium** plays an essential role in supporting **brain plasticity**, which is the sign of a youthful, flexible brain primed for optimal learning, memory, and cognitive function.[1]

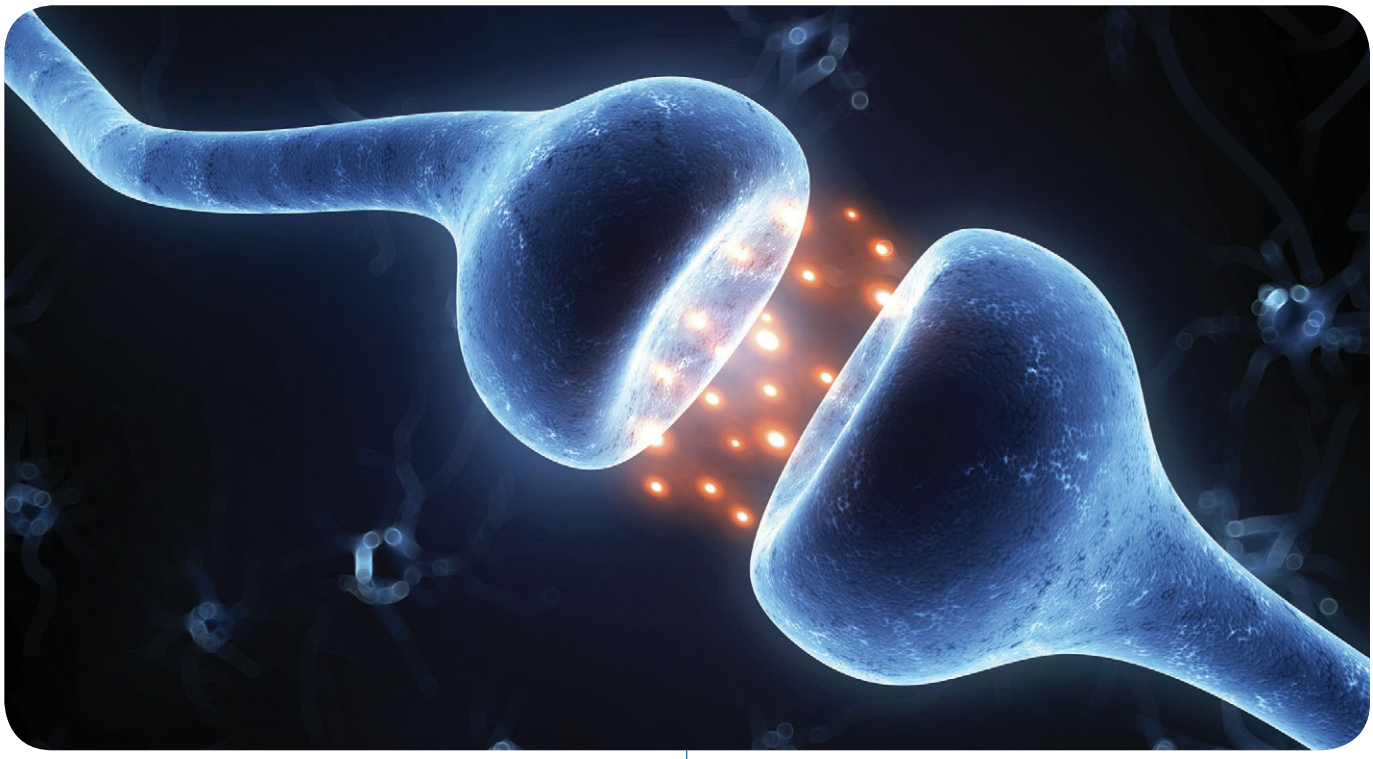
The good news is that raising brain magnesium levels has been proven to restore critical brain plasticity and improve cognitive function.[1] In a just-published landmark human study, researchers showed that they could ***reverse brain aging*** by as much as **nine** to **14** years in magnesium-supplemented people.[2]

Scientists at the **Massachusetts Institute of Technology** (MIT) found a novel way of overcoming the problem of getting magnesium loaded into the brain due to poor absorption.[1]

These researchers tested a unique compound called **magnesium-L-threonate** and found it boosted brain magnesium levels by an approximate **15%**.[1]

When comparing various forms of magnesium, they found that **magnesium-L-threonate** had the highest ***bioavailability*** and brain ***magnesium-loading ability***.

As a result, studies show that **magnesium-L-threonate** improves brain **plasticity**, leading to direct and significant improvements in **memory**, **learning**, and **cognition**.[3]



The Foundation of Learning and Memory

The human brain is capable of forming new connections between neurons. When we take in new information, an electro-chemical signal is sent across the space between neurons (called the synaptic space). This ability of the brain to form new connections or neural pathways to communicate with each other is often referred to as brain **plasticity**.

Think of it as the ability to learn a new skill, like a dance move. Our brains generate new neural pathways or "wires" to master the particular skill. On the contrary, when these "wires" become faulty or deteriorate, memories start fading and individuals can forget simple things like names or phone numbers.

Brain **plasticity** is now understood to be the very foundation of **learning** and **memory**.[4] This means that changes in memory (including the formation of new memories and learning of new concepts) requires changes in those synaptic connections, hence the term, *plasticity*.

As you are reading this article, your brain is forming and reforming new neural connections.

With aging, we lose brain plasticity, which results in a loss of cognitive function.[5] That's why a young person, with an active, *flexible* brain, easily latches on to new ideas and simply thinks faster than an older person whose brain has lost plasticity and is more fixed in its patterns.

As recently as a decade ago, scientists thought that loss of vital brain plasticity was inevitable due to age.

But they were wrong.

Recent studies have shown that increasing brain magnesium levels can reverse deteriorating brain plasticity. The result is considerable restoration of cognitive function both in healthy adults and in those with neurodegenerative diseases.[1,6-8]

The Magnesium Connection

Magnesium is absolutely critical for maintaining healthy brain plasticity. This is because magnesium regulates how brain cells form those critical connections that are the foundation of learning and memory.

In fact, magnesium ions control tiny electrical switches (technically, "ion channels") in brain cells.[9] The more signals that these electrical switches transmit, the stronger the connections between cells, and the stronger the formation of the resulting memory. Thus, magnesium concentrations are an essential part of brain plasticity—the ability to add, remove, or revise cell-to-cell connections to regulate learning and memory.

Numerous studies demonstrate the dangerous impact of insufficient magnesium on brain health.[9,10] Lab studies show us that depriving brain cells of sufficient magnesium impairs their ability to participate in optimal plasticity.[10,11] In animals and humans, we are now able to see that this loss of ***plasticity*** leads directly to a poorer performance on tests of memory.[12,13]

The reason memory is impacted is because low levels of magnesium create decreases in the *strengthening* of connections between brain cells that lead to memory formation.[10]

In addition to impacting memory, chronically low calcium and magnesium levels in the diet have also been shown to correlate with a high incidence of **neurodegenerative diseases**.[14]

Basic lab studies have shown that boosting magnesium concentrations at excitatory synapses can enhance brain plasticity.[15] In brain cells cultured from the hippocampus (the part of the brain where we store and retrieve memories), these changes led to more permanent enhancements of brain plasticity, demonstrating *long-lasting* improvement.[15] (It is important to note that the levels of magnesium needed to improve plasticity are well within the normal physiological range, not exceedingly high.)

Studies in diabetic rats provide further support for magnesium's ability to reverse losses in brain plasticity and restore cognitive function.[11]

Like diabetic humans, these rats have a high risk of developing Alzheimer's disease. Researchers found that elevating brain magnesium levels with injected magnesium protected learning and memory in diabetic rats with spontaneous Alzheimer's-like symptoms. Elevating brain magnesium levels also *reversed* impairments in synaptic function and *long-term potentiation* (the cellular equivalent of learning).[11]

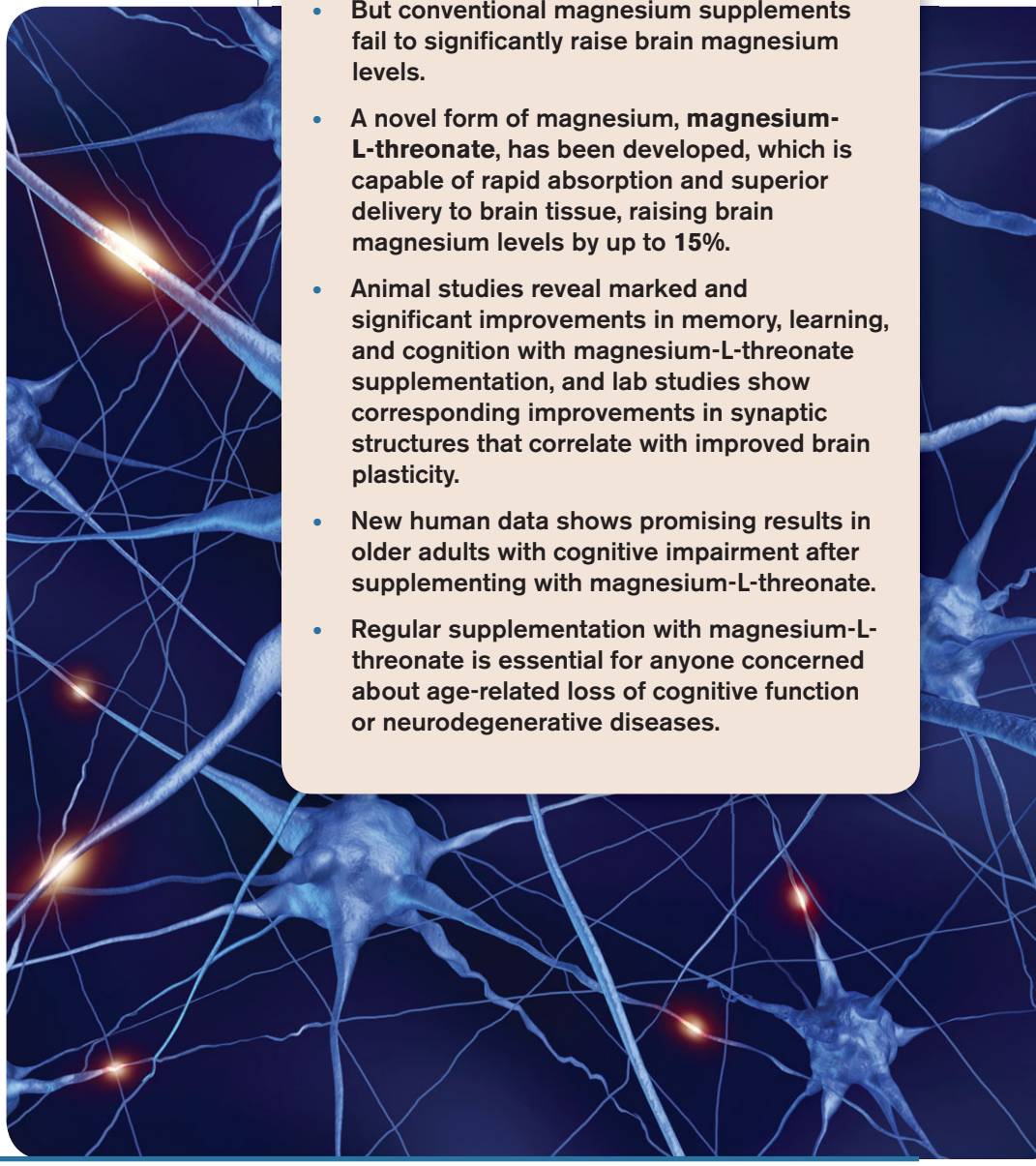
These studies make it clear that elevating brain levels of magnesium helps to improve cognition by improving plasticity (the ability to make connections between brain cells) and long-term potentiation (the strengthening of those connections).

But, one of the biggest challenges that researchers have encountered is delivering sufficient amounts of magnesium into the brain. Fortunately, scientists at the **Massachusetts Institute of Technology** (MIT) have found a solution.

What You Need to Know

Magnesium Improves Brain Plasticity

- **Brain plasticity, the ability to remodel connections between brain cells, is the physical foundation of memory and cognition.**
- **Loss of memory and cognitive function in old age and in neurodegenerative diseases is the result of lost brain plasticity.**
- **Studies show that raising brain magnesium levels restores lost plasticity and improves cognitive function in aging animals and in models of neurodegenerative diseases.**
- **But conventional magnesium supplements fail to significantly raise brain magnesium levels.**
- **A novel form of magnesium, magnesium-L-threonate, has been developed, which is capable of rapid absorption and superior delivery to brain tissue, raising brain magnesium levels by up to 15%.**
- **Animal studies reveal marked and significant improvements in memory, learning, and cognition with magnesium-L-threonate supplementation, and lab studies show corresponding improvements in synaptic structures that correlate with improved brain plasticity.**
- **New human data shows promising results in older adults with cognitive impairment after supplementing with magnesium-L-threonate.**
- **Regular supplementation with magnesium-L-threonate is essential for anyone concerned about age-related loss of cognitive function or neurodegenerative diseases.**



A Breakthrough Form of Magnesium

Scientists at MIT set out to find a better-absorbed form of magnesium that also could boost concentrations of the mineral in the brain.[1] After testing numerous compounds, they found what they were looking for in a unique compound called **magnesium-L-threonate**. This is a complex of magnesium along with *threonic acid*, a breakdown product of vitamin C.[1,16]

Figure 1 shows the dramatic results of treating rats with magnesium-L-threonate (MgT) compared with untreated control animals and with those supplemented with two other forms of magnesium.[1] Only **magnesium-L-threonate** proved capable of significantly raising magnesium levels in spinal fluid, which is a measure of brain magnesium.

Magnesium-L-threonate's effects were even more remarkable on short- and long-term memory performance in live rats (Figure 2). Compared with the other forms of magnesium, the animals that were supplemented with magnesium-L-threonate demonstrated significantly greater *memory retention* over 10 minutes and 12 hours (Refer to Figure 2 charts on next page).[1]

In addition to short- and long-term memory improvements, rats supplemented with magnesium-L-threonate demonstrated *enhanced learning abilities* and *enhanced working memory,* which are essential for normal cognitive function.[1]

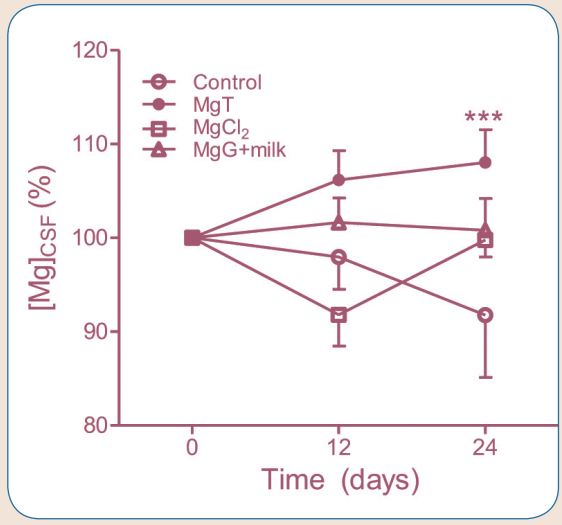
And in aged rats, supplemented animals were better at pattern completion (ability to retrieve memories based on incomplete information) compared with control animals.[1]

Microscopic examination of brain tissue explained the reason for these dramatic improvements. As expected, the rats supplemented with magnesium-L-threonate had higher densities of synaptic proteins associated with memory formation, especially in the hippocampus. These findings correlated with the animals' improved memory performance on testing.[1]

In addition, the magnesium increased the number of release sites at the presynaptic nerve endings, but reduced their overall probability of releasing neurotransmitters. This reconfiguration enabled synapses to more finely tune their transmissions, resulting in greater plasticity. The synapses were, in effect, "trained" to respond only to the "right" stimuli, producing improved memories in the live animals.[1]

Finally, the increase in brain magnesium levels enhanced *long-term potentiation*, which is the process that refers to the *strengthening* of connections between brain cells based on recent patterns of activity that is associated with enhanced learning and memory.[1,10]

FIGURE 1: Raising Brain Magnesium Levels with Various Compounds



Effects on spinal fluid (CSF) magnesium levels following supplementation of rats with various magnesium compounds. Magnesium-L-threonate (MgT) was the only one capable of significantly raising magnesium levels.[1]

Alzheimer's Disease

The ability of magnesium-L-threonate to enhance brain plasticity is of tremendous interest to researchers studying Alzheimer's disease. As tangles of toxic *beta amyloid protein* develop in Alzheimer's patients, they trigger brain cell death and the loss of brain *synapses*.[8,17-19] This hinders brain plasticity and ultimately impairs cognition.

Magnesium-L-threonate has now been tested in a widely accepted mouse model of Alzheimer's disease. In this type of study, mice are bred to show brain structural problems and cognitive defects that closely resemble those in human Alzheimer's.[17]

When the researchers treated mice early in their disease progression with magnesium-L-threonate, it *prevented* the loss of synapses and the decline of memory that occurred in untreated animals. To the researchers' surprise, the supplemented animals showed these effects even when the magnesium-L-threonate was given at the end-stage of their cognitive decline.[17]

This surprising result might be related to magnesium's ability to help *prevent* and *clear* the accumulation of toxic *beta amyloid* plaques. In one particular study, magnesium-L-threonate supplementation suppressed the expression of the enzyme responsible for beta amyloid deposits by an impressive **80%**.[20]

The researchers determined that, based on these results, magnesium could play a role in the prevention of Alzheimer's.[20]

New Findings for Post-Traumatic Stress Disorder

While Alzheimer's is the most urgent demonstration of restoration of brain plasticity by magnesium-L-threonate, it is far from the only potential application for this supplement.

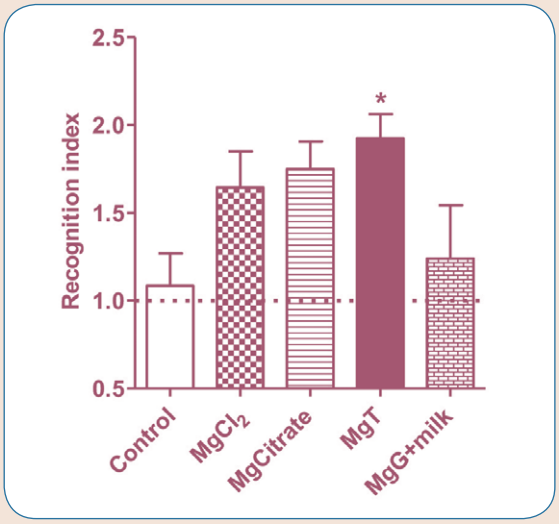
Researchers also found that magnesium-L-threonate has beneficial effects for those suffering from **post-traumatic stress disorder** (PTSD).[6]

Sometimes when our brains form connections, they aren't good ones. For example, certain objects or events linked with a previous danger triggers fear memories. In healthy people, these fear memories fade in time as the object triggering them is experienced in a safe environment. (Perhaps this is the likely scientific explanation for the phrase "time heals all wounds.")

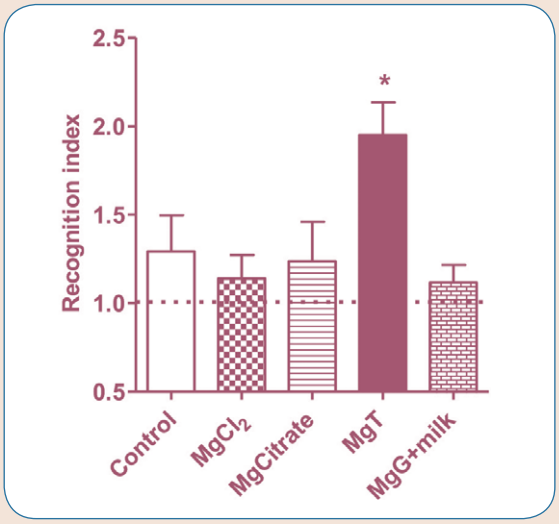
For example, if you experienced a house fire, hearing fire engines could reproduce the feelings of fear experienced from the fire itself. In time, that feeling will fade when the triggering event is experienced in a safe environment.

Unfortunately, in people who suffer from post-traumatic stress disorder, that fear response does not

FIGURE 2: Short- and Long-Term Memory Enhancements by Various Magnesium Preparations[1]



A. Short-term (10 minute) memory performance in rats following supplementation with various magnesium preparations. Only magnesium-L-threonate (MgT) showed significant improvements.



B. Long-term (12 hour) memory performance in rats following supplementation with various magnesium preparations. Only magnesium-L-threonate (MgT) showed significant improvements.

fade with time. This is likely due to the fact that post-traumatic stress disorder induces a sharp reduction in **brain plasticity**.[21-24]

Exciting research has demonstrated that magnesium-L-threonate can help speed up this recovery process in people suffering from post-traumatic stress disorder.

Scientists studied magnesium-L-threonate in rats with conditioned fear responses (the animal equivalent of post-traumatic stress disorder). Amazingly, the magnesium-L-threonate treatment helped the fear memory fade with time, *without impacting the original memory*.[6,25]

Research shows that magnesium-L-threonate enhances brain plasticity in *specific* regions of the brain most affected by traumatic events.[6] Because of these dramatic results, scientists are suggesting that magnesium could be a novel supplement for those suffering from post-traumatic stress disorder, anxiety, or depression.[6,25]

Recent Human Study

A remarkable **human** study on magnesium-L-threonate was released late in **2015** with compelling results that corroborate and extend all of the previous laboratory findings.[2]

Men and women aged 50 to 70, who reported cognitive problems (e.g., memory and concentration) were enrolled in the study. They were randomly assigned to receive either placebo or a supplement containing magnesium-L-threonate. Subjects took **1.5 grams** per day of the supplement if they weighed less than 154 pounds, and **2 grams** per day if they weighed more.

Subjects were evaluated before starting the supplement and again at weeks six and 12 (end of the study). At each evaluation, subjects participated in a series of tests of cognitive function, while blood and urine tests were performed to calculate total body magnesium status.[2]

By 12 weeks, lab results showed that magnesium-L-threonate was effective at loading magnesium into the body, as well as into cells (red blood cells were used because it is impossible to safely sample brain cells in humans).[2]

This form of magnesium was shown to be effective at loading magnesium into the brain and at enhancing brain function. This was made clear by results of cognitive testing. Already by week six, supplemented subjects demonstrated significantly increased speed in tests of executive function (e.g., reasoning, problem-solving, and planning). By week 12, that increased speed reached an approximate **20%** improvement over baseline, while placebo recipients experienced no significant change.[2]

What Is Magnesium?

Magnesium, the fourth most abundant mineral in the body, is known to be a co-factor for more than 300 reactions catalyzed by enzymes, including those essential for energy release from food and conversion to cellular work through formation of adenosine triphosphate, or ATP, in mitochondria. Magnesium is also required for the synthesis of DNA and RNA.[27]

Magnesium is especially important in all of our bodies' electrical and electrochemical activities, including muscle contractions, heart rhythm, nerve conduction, and brain cell activity.[27]

The most common disturbance of magnesium in our bodies is hypomagnesemia, or low blood magnesium levels, which is widely recognized as a cause of seizures, hypertension, stroke, migraine headaches, attention deficit hyperactivity disorder, and metabolic conditions such as insulin resistance and type II diabetes.[27]

In addition to all of these known functions, magnesium has been found to be the controlling and essential factor in regulating synaptic plasticity in the brain, which is the physical process that underlies what we perceive as learning and memory.[1]

There was also a significant **13.1%** improvement in supplemented subjects' working memory (the memory we use, for example, to remember where we put things) and a significant **37.6%** improvement in episodic memory (for example, the ability to put new faces and names together). And composite scores of overall cognitive ability rose significantly from baseline and compared with placebo at both weeks six and 12.[2]

Tellingly, magnesium loading into red blood cells was significantly correlated with enhancement in overall cognitive ability in supplemented patients. This was a strong validation of earlier animal studies in which raising brain magnesium levels boosted cognitive function.[1]

An unexpected benefit was also demonstrated when the researchers examined ***fluctuations*** in cognitive performance over time. Such a fluctuation is known to be an early sign of impending cognitive impairment.[2,26] Not only did supplemented patients experience less cognitive fluctuation, but the changes that they did experience were primarily positive (performing better than usual).

All of these data provide impressive support for the use of magnesium-L-threonate to improve cognitive function. But the real shocker comes with an analysis of this study's subjects in the context of normal brain aging.

The researchers compared results of their study with data from a second study of cognitively normal subjects. They determined that cognitive performance fell about **1.04%** per year in the cognitive normal subjects. Researchers established that baseline performance in the first study was about **10%** lower than that of age-matched controls. But after 12 weeks of supplementation, the average *increase* in performance was **10.3%**, essentially restoring performance to that of age-matched people without cognitive decline.[2]

A still more remarkable finding became evident when researchers used the normal cognition study to assign a "brain age" to each of their own study subjects. Using this calculation, for example, a **50**-year-old with a **10%** worse performance on cognitive testing would have a brain age equivalent to that of a cognitively normal **60**-year-old (approximately **1%** function loss per year).[2]

Using that calculation, the researchers found that even though the average chronological age of subjects who completed their study was 57.8 years, their average brain age at baseline was 68.3 years. But by 12 weeks, the brain age of the supplemented subjects had fallen by an average of **9.4 years**, while that of placebo recipients fell by less than a year.[2]

In other words, supplementation with magnesium-L-threonate resulted in an effective ***reversal of brain age*** to near normal. The brain age reversal in subjects who had significant increases in red blood cell magnesium was still higher, at **14.6 years**, moving those individuals into a brain age in fact younger than their actual age in years!

Summary

The loss of ***brain plasticity*** is at the heart of age-related loss of cognitive function. As our brains lose flexibility, we lose the ability to learn new concepts, to make sharp judgments, and to develop new skills.

Loss of brain plasticity is implicated in both the "natural" loss of brain function with aging and with accelerated cognitive decline as seen in Alzheimer's and other neurodegenerative diseases.

Restoring brain plasticity has become a major focus of neuroscientists aiming to slow or eliminate the loss of brain function over time.

Studies show that boosting brain magnesium levels dramatically renews the ability of brain cells and, in animals, to form new memories and discriminate between existing ones. But conventional magnesium supplements are inadequately delivered to brain tissue, challenging our ability to effectively raise brain magnesium levels.

The development of **magnesium-L-threonate** appears to have shattered that barrier. Studies show that this compound enters brain tissue more effectively than other magnesium preparations, and is significantly more effective at restoring memory functions and brain plasticity in numerous animal models, including those of Alzheimer's disease.

Recent new **human** data on **magnesium-L-threonate** shows promising results in older adults with cognitive impairment. Those interested in preventing cognitive decline and in restoring active, flexible brains should consider daily supplementation with magnesium-L-threonate. No other magnesium preparation comes close to its performance. ●

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

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BY JULES CHESTERFIELD

Major Advance *in Screening and Treating* PROSTATE CANCER

GARY ONIK, MD

Countless numbers of men are alive today because a **PSA** blood test identified cancer ***early*** enough for curative therapies to be deployed. Some famous people diagnosed early with prostate cancer who continued to live productive lives include:

Name	Year Successfully Treated
Robert De Niro	2003 at age 60
John Kerry	2003 at age 60
Rudy Giuliani	2000 at age 56
Robert Goulet	1993 at age 60
Colin Powell	2003 at age 66
Arnold Palmer	1997 at age 68

What we don't know is how many treatment side effects, such as urinary incontinence, impotence, and chronic pain, these men may be dealing with.

Because as many as **1** in **7** American men will be diagnosed with prostate cancer, **Life Extension®** has sought to identify more effective and less side-effect-prone treatments. Our objective is to find innovative and compassionate doctors who are achieving impressive results without resorting to radical prostatectomy surgery and radiation.

This article describes a physician/scientist who has spent decades perfecting a minimally invasive diagnostic and treatment approach that may revolutionize conventional prostate cancer treatment.

The Dilemma…

Men have every reason to be confused about prostate cancer screening and treatment.[1]

On one hand, experts tell us that prostate cancer is the second most common malignancy in men, as well as the second leading cause of cancer-related death in modern industrialized countries.[2,3]

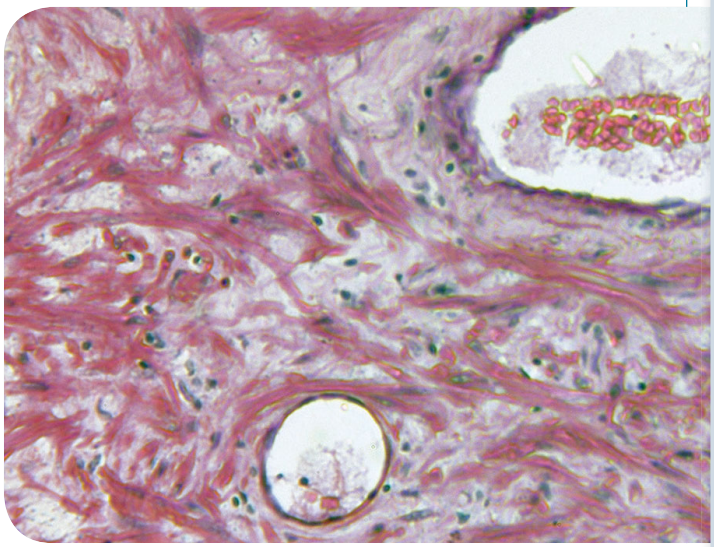
On the other hand, equally reliable sources tell us that prostate cancer screening is overused and can lead to a diagnosis of trivial cancers, resulting in excessive biopsies and surgical procedures.[1,4-6]

So what is a man to do? Skip blood tests and take a chance with a potential killer? Or undergo screening with its possibility for a false alarm, with side-effect risks.

Modern medicine has arrived at this quandary with the best intentions. Advances in screening tests have enabled doctors to detect cancers at earlier stages. That's generally considered a good thing in oncology circles.

What's happened is that small-size/non-aggressive prostate cancers that pose only minimal risk can now be detected. But treatment technology has not kept up with diagnostics, leaving physicians with surprisingly crude techniques for biopsy and removal of suspect cancers. Virtually all conventional approaches to prostate cancer incur risk of incontinence and impotence, in addition to the possibility that a serious tumor mass could still be missed.

These concerns shift the benefit-risk calculation sharply and have caused some men and their physicians to take a dangerously conservative position, leaving open the possibility that they might be missing deadly cancers. These cancers could be amenable to treatment if we could only locate them with certainty and treat with sufficient precision to avert serious complications.



A Better Technology

Gary Onik, MD, is a visionary prostate expert and inventor who thinks that this dilemma represents a false dichotomy. Using techniques Dr. Onik and his colleagues have developed over the past decade, it is now possible for a man to undergo the rough equivalent of a "lumpectomy" of the prostate.[7] This procedure allows a urologist to precisely identify a tumor (or tumors) within a three-dimensional matrix of the prostate gland, then selectively destroy tissue only where malignant cells are documented.

Dr. Onik and his team recently reported the results of a 10-year average follow-up of 70 study participants that demonstrated superior results in medium- and high-risk patients compared with standard treatment of the whole prostate gland.[7] Remarkably, Dr. Onik's approach was equally successful at preventing recurrence for all risk categories of cancer, compared with standard treatments that are so side-effect prone.

Delineating the PSA Quandary

Widespread use of blood screening for PSA has permitted very early detection of prostate cancers. Too early, some experts believe, raising concerns that many cancers now being diagnosed are too trivial to justify a radical prostate operation, with its inherent risks to continence and potency.[26] Yet at the same time, a large proportion of men are reluctant to accept the idea of "watchful waiting," knowing that their bodies harbor a malignancy.[26] Most men prefer a more active role in managing their own health.

This situation has led to a quandary in which neither patients nor physicians feel comfortable, yet official policy recommends against routine PSA screening.

This quandary may become moot if more patients and physicians recognize the value of ***optimized focal therapy for prostate cancer***, using the tools and protocols developed by Dr. Onik and his team. By making prostate cancer detection more precise, and removing ***only*** the tiny amount of prostate tissue that has turned malignant, concerns on both sides of the PSA debate can be eliminated.

Equally important is evidence that this novel procedure may generate a localized reaction that destroys residual peripheral cancer cells, while generating a systemic immune response against malignant cells that have escaped the prostate gland.

Introducing "Lumpectomy" for Men

Dr. Onik has written that *"prostate cancer in men raises many of the same issues that breast cancer does in women. Complications of prostate cancer treatment, including impotence and incontinence, affect the self-image and psyche of a man no less than does the loss of a breast in a woman."*[8]

It was this insight that led Dr. Onik and his team to explore the possibility of a male version of lumpectomy. In other words, selective identification of a prostate tumor's location and precise removal of the diseased tissue while sparing surrounding structures and their important functions.[8-11]

To understand the promise of Dr. Onik's "lumpectomy" approach, one has to grasp the anatomical challenges posed by prostate cancer.

The prostate gland, unlike the breast, is in an extremely hard-to-reach location. Bounded by bone, bladder, and rectum, and containing the urine- and semen-carrying urethra, the gland cannot readily be exposed and directly examined.

This is further complicated by the fact that most men with early prostate cancer have no symptoms that might help guide or localize therapy. There is no palpable "lump" detected by patient. Instead, the concern about cancer is raised either on a rectal examination by a skilled clinician or by an elevated level of PSA in the blood.

Neither technique, of course, provides information about the potential severity or extent of any tumor found. To get that evidence, doctors turn to an ultrasound procedure, typically followed by a needle biopsy (tissue sampling) under ultrasound guidance.

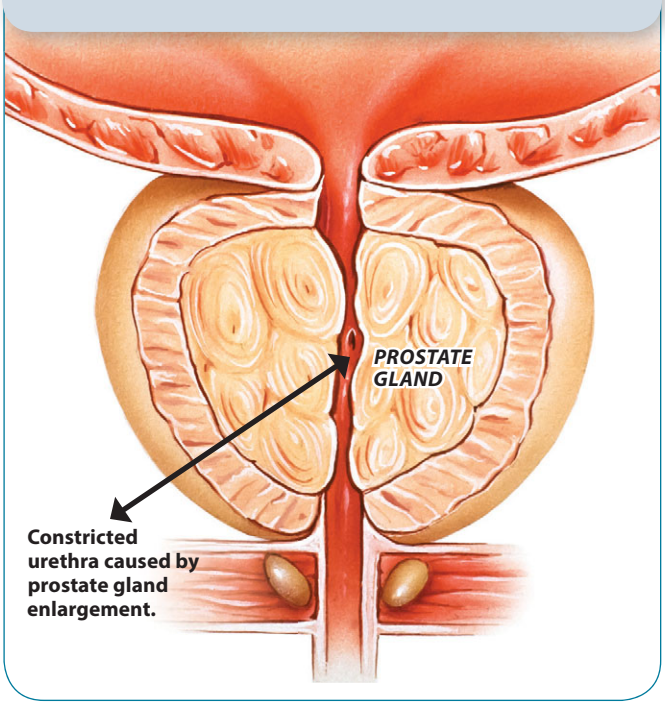
The most common approach is called **transrectal ultrasound** biopsy. The main problem with this technique is that it's inadequate for assuring that all of the tumor will be detected, and misses up to **46%** of significant (high-grade) cancers.[7,12] Studies have shown that transrectal ultrasound biopsies bear little resemblance to the actual pathological findings when the entire gland is removed, which clearly indicates room for improvement.[12,13]

Numerous sources suggest that the use of **multiparametric MRI** is useful for identifying and locating significant cancer in the prostate. While indications suggest that the use of the multiparametric MRI technology is more accurate than a transrectal ultrasound biopsy in the identification of cancer, findings have shown that its sensitivity for picking up clinically significant tumors in the peripheral zone (or outer area) of the prostate was **85%** and just **62%** in the transition zone (or innermost section) of the prostate.[14]

What You Need to Know

Breakthrough Prostate Cancer Testing and Treatment

- **Prostate cancer is a common and sometimes deadly cancer.**
- **Early detection through screening and specific therapy is standard oncological practice for most malignancies.**
- **A 2008 report questioned routine blood testing for evidence of prostate cancer in men over 50. Physicians and patients have been at a loss for the best way forward in balancing the risk of unnecessary treatment against that of late diagnosis of a malignancy.**
- **Thanks to the work of Dr. Gary Onik and his team, that dilemma is largely out of date.**
- **Dr. Onik combines precise, three-dimensional prostate mapping biopsy with equally precise three-dimensional destruction of tumor by freezing, to produce results equivalent to or better than standard approaches but with sharply reduced post-surgical side effects.**
- **Men should discuss optimized focal therapy for prostate cancer with their physicians, to allow for routine PSA testing and proper, lower side-effect risk treatment.**



Not surprisingly, treatments based on an inadequate diagnostic technique have a high likelihood of being inadequate themselves, either overtreating a cancer that is in fact trivial or missing some parts of a viable tumor that will lead to a recurrence. In part to avoid those outcomes, current treatments target most or all of the prostate gland, to ensure that as much tumor as possible will be removed (such as radical prostatectomy).

Thus, inaccurate diagnoses coupled with heavy-handed, one-size-fits-all surgical approaches incur substantial risk of damaging important nerves and other structures that can potentially leave a man with urinary or erectile dysfunction, without necessarily providing a cure of the cancer itself.[8]

More Accurate Detection and Diagnosis Changes Tumor Management

In the early 2000s, Dr. Onik and his team began exploring better techniques for prostate cancer detection, using an array of emerging high-technology devices in the hope that they could improve on the performance of standard transrectal ultrasound guided prostate biopsies.

First, they began using a highly accurate means of examining the prostate gland in three dimension and obtaining biopsy specimens from the entire bulk of the gland. A technique called ***three-dimensional prostate mapping biopsy***, **3D-PMB**, provides more accurate information about a tumor's extent and location compared with a standard **transrectal ultrasound** biopsy.[12,15]

This *three-dimensional prostate mapping biopsy* is extraordinarily accurate and painless, and it does not involve puncturing the rectal wall. This sterile procedure greatly lowers the chance for life-threatening sepsis and debilitating prostatitis, which are sometimes the result of standard transrectal ultrasound biopsies.

By **2009**, with five years of experience using three-dimensional prostate mapping biopsy, Dr. Onik's team published a study of men who had previously undergone a standard biopsy using transrectal ultrasound guidance and whose results showed tumor on only one side of the gland.[12] These men were considering "conservative" management, meaning that they were likely to receive no further treatment while being carefully observed.

As a result of performing the three-dimensional prostate mapping biopsy on the 180 men who were identified as having cancer on one side of the gland by the standard transrectal ultrasound biopsy, Dr. Onik identified:

- 110 patients (**61.1%**) who had tumor on both sides
- 41 patients (**22.7%**) whose tumor grade (severity) increased from a low-grade score to an intermediate-grade score
- 35 patients (**19.4%**) who were found to have cancer dangerously close to nerve and blood vessel bundles

Overall, **69.4%** of the men originally diagnosed by transrectal ultrasound to have low-grade, one-sided tumors meriting just "watchful waiting" (active surveillance) turned out to have at least one finding that might have changed their cancer management plan to a more aggressive approach.[12]

Dr. Onik's findings are being corroborated by other inventive physicians using enhanced imaging techniques.[14]

Optimized Focal Therapy for Prostate Cancer

Having clearly identified the more accurate higher-resolution diagnostic properties of **three-dimensional prostate mapping** biopsy, Dr. Onik and his team went on to study the results of treating men according to its results. To do so, they used an approach called ***optimized focal therapy***.[7]

"Focal" is medically defined as "localized." So "focal ablation" in this context refers to precise localized removal of malignant prostate tissues.

In this technique, patients first undergo biopsies by *three-dimensional prostate mapping* to accurately locate the tumor or tumors in three-dimensional imaging of the prostate gland. The location of each specimen is carefully noted and correlated with the pathology report for each site. This allows physicians to see not only the three-dimensional extent of the tumor but also its most concerning areas.[7]

Next, using their detailed three-dimensional map of each man's prostate, the team returns to the diagnostic suite armed with a ***cryoablation*** device. Cryoablation means "destruction by cold." It is a technique widely used for removal of focal areas of diseased tissue while assuring minimal collateral damage to adjacent healthy structures (anyone who has had a wart "burned off" with liquid nitrogen has undergone a simplified version of this technique).

Dr. Onik's team used their three-dimensional map of tumor extent and severity to guide their ablation tool, aiming to destroy all known areas of tumor while sparing vital structures such as nerve/blood vessel bundles. They carefully control the freezing temperatures to assure that they deliver the precisely correct amount of tissue-killing freeze to each area of the tumor.[7]

Findings from 10-Year Study Using Focal Ablation Therapy

A long-term clinical trial was initiated to ascertain the accuracy, safety, and efficacy of **focal cryoablation** therapy using precise ***three-dimensional prostate mapping biopsy***.

Dr. Onik's team treated 70 men in this fashion, giving them a blood test for the PSA tumor marker at quarterly intervals for two years, then every six months. Men were determined to be "biochemically disease free" when their PSA level stabilized, indicating no actively growing tumor.[7]

Additional follow-up determined the degree to which each man's potency and urinary continence had been affected, to identify common side effects of prostate surgery.

By the end of the study, Dr. Onik had data for an average of over **10** years on **70** subjects aged 45 to 77 years at the time of the procedure, an ample number for analysis.

Overall, 66 men survived to the end of the study, and none died of prostate cancer, yielding a "disease-specific" survival rate of **100%**. Biochemical disease-free survival (proportion of men achieving PSA stability) was **89%** overall.

Men with prostate cancer are categorized according to risk level based on the characteristics of the cancer, the Gleason score (a measure of the aggressiveness of the cancer), the stage (extent of the cancer), and the

PSA level. With conventional treatments, patients with low-risk cancer have an approximate **85%** long-term disease-free survival rate while men at high risk have a success rate that falls to **45%**.[16] Surprisingly, with the focal **cryoablation** treatment, there seems to be no difference in patient results based on risk level.[7]

Biochemical disease-free survival was **90%** in men categorized as low-risk, **88%** in medium-risk, and **89%** in high-risk men, showing no statistically significant difference among the risk levels.[7] In other words, unlike existing therapies, all men had superb results regardless of their original risk category.

Dr. Onik's approach of focal cryoablation represents the first time that statistically identical survival rates were obtained across all cancer risk levels through use of a localized, minimally invasive prostate cancer treatment. Importantly, the use of the *three-dimensional prostate mapping biopsy* also lowered the local recurrence (patients who needed to be retreated due to more cancer found within the gland) to just **4%**.[7]

Complications occurred with extremely low frequency after optimized focal therapy: A full **100%** of men retained urinary continence, requiring no absorbent pad use, while **94%** of men remained normally potent after the first treatment.[7]

There are a number of potential reasons for these results:

"A cryoimmunological response must also be considered for these results in medium- and high-risk patients," wrote Dr. Onik and colleagues in a paper published in the Journal of Men's Health. *"Based on the human and animal data, it is likely that in some patients there is exposure of tumor antigens at the time of the procedure that acts as an in vivo cancer vaccine, preventing later metastasis from occurring."*[7]

Said differently, as the prostate tumor mass is being damaged/destroyed by the cryoablation (freezing) technique, barriers to recognition by the immune system are broken down. This can enable immune cells to take notice of the tumor's genetic makeup and initiate attack

against malignant lesions in other parts of the body that have spread or metastasized beyond the prostate capsule. This immune-boosting phenomenon has been observed in response to laser and certain localized radiation procedures.[17-20] Interestingly, another medical team utilizing cryoablation reported the spontaneous remission of metastatic prostate cancer after freezing of the primary tumor for palliation.[21]

Dr. Onik's team identified another mechanism by which **focal cryoablation** may be effective in treating malignant disease outside the prostate capsule. They wrote: *"Focal cryoablation has an ability to treat extra-capsular disease. Patients at high risk for positive margins at prostatectomy have a better chance of local control with ablative therapy."*[7]

Comparative Studies

Optimized focal therapy appears to be superior to several other modern techniques at producing biological disease-free survival. In one study of prostate patients treated with specialized radiation therapy, **10-year** biochemical disease-free survival was **81%** for low-risk, **78%** for medium-risk, and just **62%** for high-risk men, using identical criteria for success.[22]

In a study of robotic radical prostate removal—considered by many to be the "gold standard" of prostate cancer treatment[7]—the biochemical disease-free survival rate in ***all*** patients was just **72%**, even when measured at only five years, rather than 10 years, after the procedure.[23]

That study also found substantial amounts of cancer on the margins of the removed tissue—indicating some cancer remained—in **23%** of low-risk, **29%** of medium-risk, and **42%** in high-risk patients.[23] These patients would, under current guidelines, be offered additional radiation therapy, which adds both risk and cost to an already complicated procedure.[24]

Thus, Dr. Onik's team appears to have realized their dream of performing the equivalent of a lumpectomy in men with prostate cancer. They identified the extent and severity of the disease in a large group of men using three-dimensional mapping and biopsies, then used that information to selectively destroy tissue in a fashion personalized for each individual patient. Their results are equivalent to more radical surgical approaches in low-risk patients, and superior to those in medium- and high-risk patients for achieving cancer-free status.[7]

An Answer to the PSA Screening Quandary

Because of these compelling results, Dr. Onik has suggested that the debate regarding PSA screening can easily be resolved.

That quandary was first produced by the **United States Preventive Services Task Force**, which in **2008** recommended discontinuation of routine **PSA blood testing** in most men, citing the emotional turmoil and potential for overtreatment raised by excessively early detection of small prostate tumors.[25]

But that United States Preventive Services Task Force recommendation made the assumption that prostate cancer diagnosis and treatment were static and unchanging, making the risk-benefit choice in some cases favor watchful waiting rather than aggressive treatment.

With the dawn of the era of optimized focal therapy for prostate cancer, the calculus has changed. Tumors can now be identified, localized, and staged with unprecedented accuracy, using three-dimensional mapping and biopsies. Focal cryoablation based on the three-dimensional map allows each man's therapy to be personally customized, resulting in higher rates of disease elimination with few of the complications that spurred the task force's fears.

Dr. Onik firmly believes that, with the availability of these enhanced techniques of diagnosis and treatment, all men should once again undergo routine PSA screening and digital rectal exam, with much less fear of unintended consequences if a suspicious lesion is discovered.

In his opinion, there never was anything wrong with the PSA test. It was simply being applied in a group of patients for whom tailored therapy was not available,

resulting in a one-size-fits-all approach that did no favors for many men. But that argument can now be convincingly retired, Dr. Onik says, with the net result that more men will receive more appropriate therapy for their own specific prostate cancers.

Although the results of the Onik study are impressive, additional confirmatory studies will be required for widespread acceptance.

Summary

Ever since the 2008 publication of the United States Preventive Services Task Force report condemning routine use of PSA testing to detect early prostate cancers, physicians and their patients have been at in a quandary regarding the best approach for detection and treatment of prostate cancer.

The options seemed limited to one of two extremes: Test early and run the risk of unnecessarily invasive surgery and its performance-related side effects, or refrain from testing until obvious symptoms arise, risking the chance of more advanced and potentially fatal cancer.

A proper balance has been restored with an approach championed by **Gary Onik, MD**. Men can now return to regular PSA screening, and, if found to be at risk of harboring a prostate tumor, undergo precise three-dimensional prostate mapping biopsy followed by equally precise cryoablation of just the malignant tissue, largely sparing the vital structures needed to sustain potency and continence.

As discussed in the opening editorial in this month's issue of ***Life Extension***® magazine, there are also opportunities for men with a rising PSA to reverse it via modifications to their diet, lifestyle, supplement, hormone, and medication program.

Any man over 40 years old should include the **PSA test** with their annual screening for modifiable disease risk factors. If the result comes back very high, or if there is a consistent rise in PSA readings over time, the use of ***three-dimensional prostate mapping biopsy*** should be considered for **diagnosis** to assess if one has prostate cancer.

If the biopsy comes back positive, then ***focal cryoablation therapy*** can be performed during the same diagnostic procedure as a potential **curative treatment**. ●

Where to Inquire about Three-Dimensional Guided Diagnosis and Cryoablation

The **International Strategic Cancer Alliance** (ISCA) provides comprehensive services to their clients and assists them in locating and receiving the best diagnostics and treatment options anywhere in the world.

This article is an example of a major advance in prostate screening and treatment by Gary Onik, MD, which ISCA is excited to bring to the readers of *Life Extension*® magazine. ISCA is prepared to help those who want further information about Dr. Onik's approach. For more information, please call ISCA at 1-610-628-3419.

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

For more information regarding Dr. Onik's approach for prostate cancer, please call ISCA at 1-610-628-3419.

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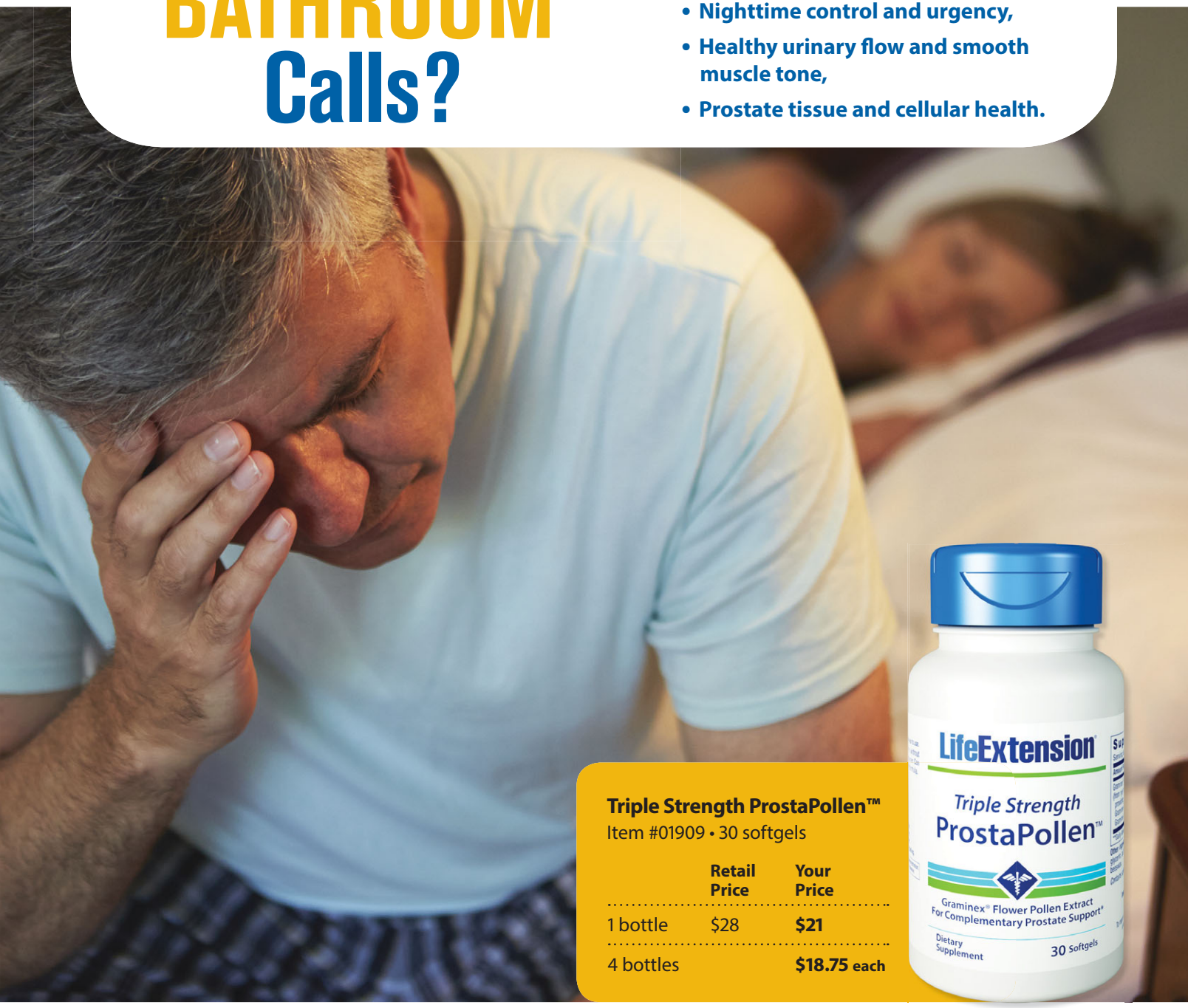

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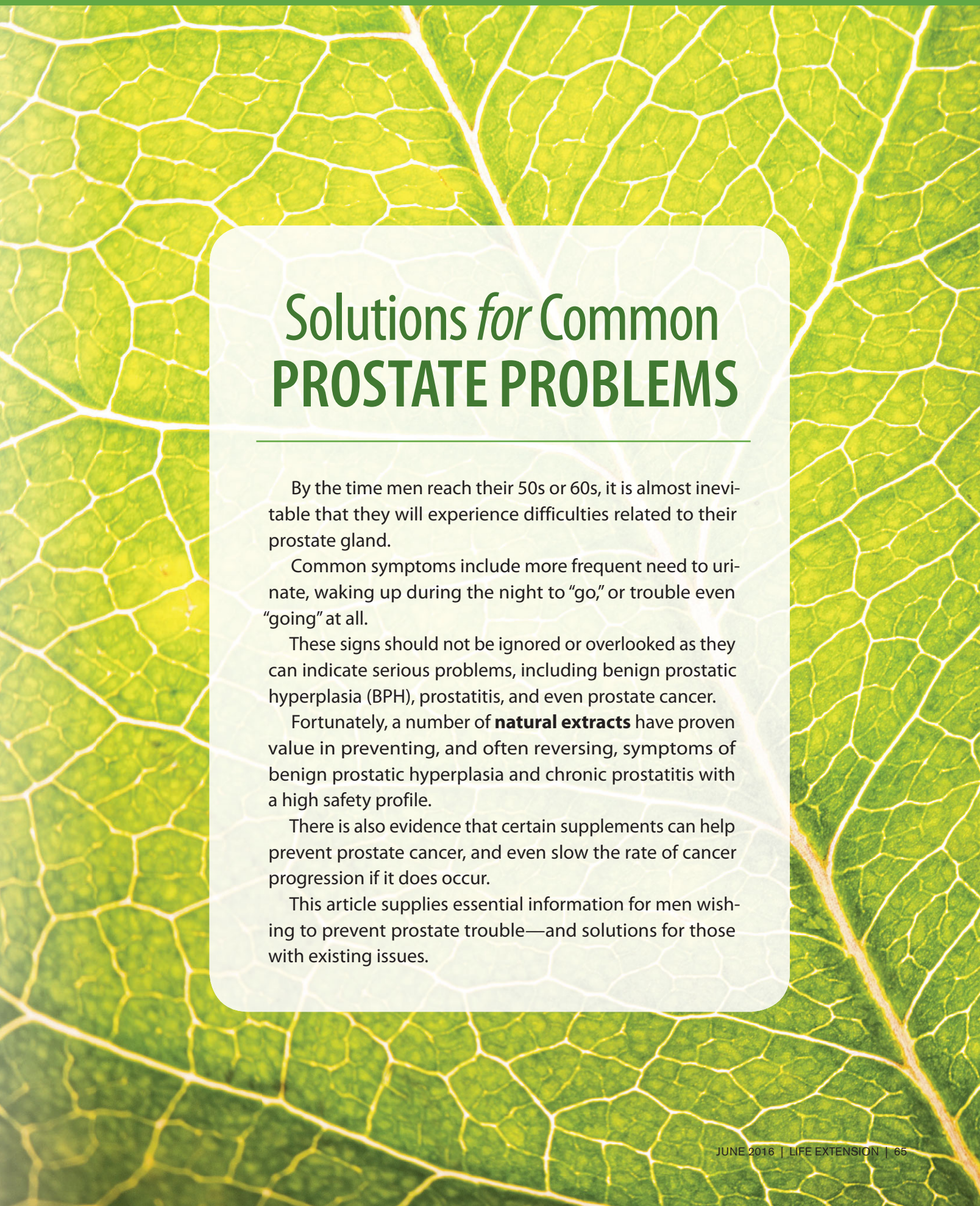


Solutions *for* Common PROSTATE PROBLEMS

By the time men reach their 50s or 60s, it is almost inevitable that they will experience difficulties related to their prostate gland.

Common symptoms include more frequent need to urinate, waking up during the night to "go," or trouble even "going" at all.

These signs should not be ignored or overlooked as they can indicate serious problems, including benign prostatic hyperplasia (BPH), prostatitis, and even prostate cancer.

Fortunately, a number of **natural extracts** have proven value in preventing, and often reversing, symptoms of benign prostatic hyperplasia and chronic prostatitis with a high safety profile.

There is also evidence that certain supplements can help prevent prostate cancer, and even slow the rate of cancer progression if it does occur.

This article supplies essential information for men wishing to prevent prostate trouble—and solutions for those with existing issues.

The Aging Prostate Gland

The three most common prostate conditions are:

1. **Benign prostatic hyperplasia**
2. **Prostatitis** (inflammation of prostate)
3. **Prostate cancer**[1]

These conditions often produce similar symptoms in their early stages, making it difficult to differentiate between them. These common symptoms can include the following:

- More frequent need to urinate
- More urgent need to urinate
- Decreased urine flow or dribbling
- Frequent nighttime awakening to urinate
- Burning with urination

The reason prostate problems are likely to cause trouble with the lower urinary tract has to do with the prostate's location. The prostate is located between the lower part of the bladder and the rectum. It surrounds the internal part of the *urethra*, the tube that carries urine from the bladder to the end of the penis.

When the prostate swells, whether because of benign prostatic hyperplasia, prostate cancer, or prostatitis, it narrows the urethra, making it difficult for urine to pass freely from the bladder. As the gland continues to grow, it can produce sufficient blockage to lead to difficulty urinating, and even urinary retention, which in turn can result in bladder and kidney infections.

While most prostate problems can be readily treated—and the vast majority are not cancer-related—it is important to seek medical attention as soon as a symptom arises.[1]

Researchers have identified a number of nutrients that have been found to alleviate many of the unpleasant prostate symptoms. Let's look at the data on some of the best-known and most effective supplements that can help men optimize their prostate health.

Nature's Solutions for Benign Prostatic Hyperplasia

Benign prostatic hyperplasia is an enlargement of the prostate gland. Approximately **25%** of men in their 40s have benign prostatic hyperplasia, with a startling **80%** of men in their 70s suffering from the condition.[2]

The good news is that benign prostatic hyperplasia (BPH) is not cancerous. It is a major risk factor for sexual dysfunction. Conventional treatments for benign prostatic hyperplasia can cause unpleasant side effects that are also a cause for sexual dysfunction.[3]

Fortunately, studies have shown that certain nutrients help alleviate many of the symptoms associated with benign prostatic hyperplasia and can significantly improve quality of life as a result.

Saw Palmetto

Saw palmetto is one of the most well-known natural treatments for prostate problems. Recent studies suggest that saw palmetto may also be beneficial for chronic prostatitis, prevention of prostate cancer, and even sexual dysfunction.[3,4]

There is evidence to suggest that saw palmetto has similar efficacy to finasteride (Proscar®) and tamsulosin (Flomax®), two medications used to treat benign prostatic hyperplasia.[3,5,6] Of even greater interest, a lower incidence of associated sexual dysfunction was seen in men supplemented with saw palmetto compared to those given pharmaceuticals.[5]

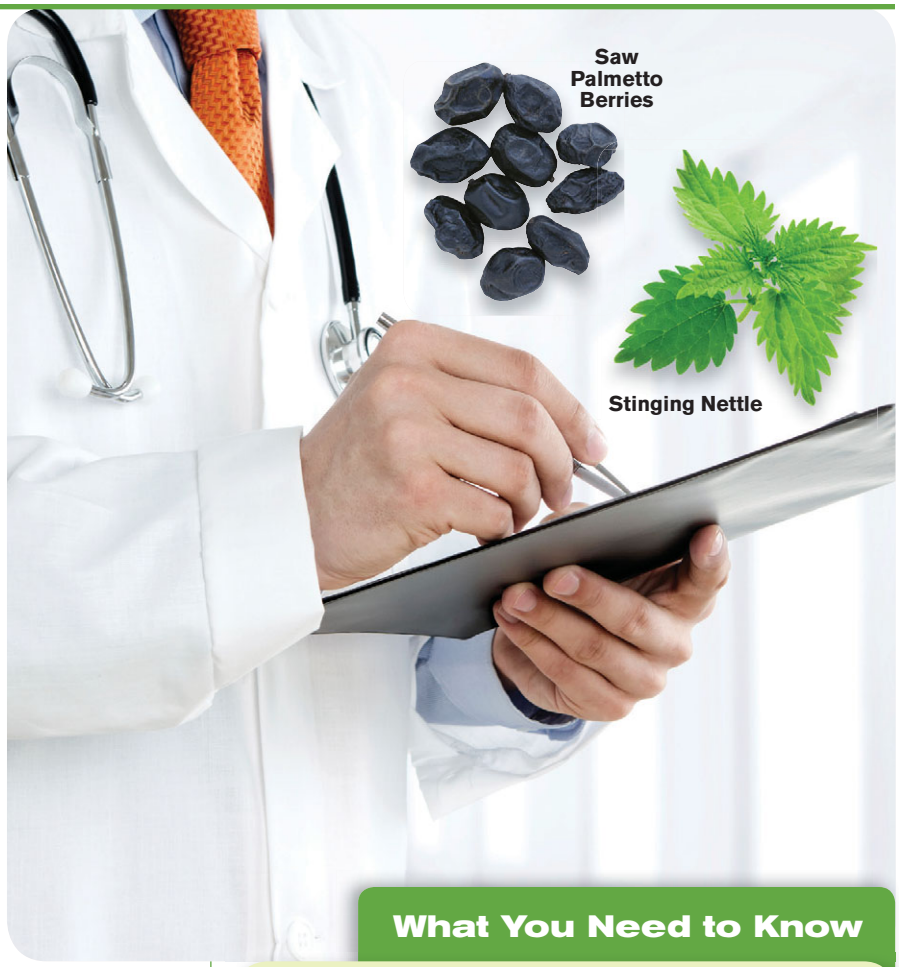
A 2013 study demonstrated that elderly men treated with **320 mg** of saw palmetto extract daily for eight weeks not only experienced a significant **52%** improvement in their **International Prostate Symptom Score** (IPSS), the standard tool used to measure the severity of benign prostatic hyperplasia symptoms, but also had a significant **40% *improvement*** in sexual dysfunction scores![3]

A host of other studies compellingly demonstrate the impact of saw palmetto extract on symptoms of benign prostatic hyperplasia. Two large meta-analyses including more than 7,000 men from 38 studies showed that saw palmetto extracts produced

significant improvements in the International Prostate Symptom Score, reductions in frequency of nighttime urinations, and improvements in peak urine flow rates.[7,8] Indeed, saw palmetto produced similar improvements in urinary symptoms and urinary flow compared to the drug finasteride, *but with fewer adverse effects*.[7]

Based on all of these studies, a 2015 review article concluded that, while drug therapy might be most effective for moderate to severe benign prostatic hyperplasia, herbal medications including saw palmetto are useful for men with mild to moderate symptoms.[9]

Not all studies demonstrate desired relief with saw palmetto,[10] which is why combining it with additional nutrients is the preferred choice for most aging males.



Stinging Nettle Root

Stinging nettle root (*Urtica dioica*) has been widely used as therapy for benign prostatic hyperplasia.[11] Both human and animal studies have shown that nettle root extract is effective not only in relieving benign prostatic hyperplasia *symptoms*, but also in shrinking the *size* of the prostate gland.[11-13]

A study on nettle root extract was shown to improve lower urinary tract symptoms significantly better than placebo, with marked improvements in the International Prostate Symptom Scores, increases in peak urinary flow rates, and reductions in residual urine volume remaining in the bladder.[12]

The most compelling findings show that the combination of nettle root extract *and* saw palmetto extract can produce improvements similar to those of prescription benign prostatic hyperplasia medications with far fewer adverse events.[6,14,15] Of particular interest, a study involving 257 elderly men with benign prostatic hyperplasia found that the combination of the extracts reduced the International Prostate Symptom Scores by **53%**, improve urinary flow by **19%**, and reduced residual urine volume by **44%** when compared to placebo.[16]

In addition, repeated studies have revealed that saw palmetto, combined with nettle extract, can reduce nighttime urination by one episode per night, a substantial and significant difference.[14]

What You Need to Know

Natural Treatments for Prostate Health

- **The prostate is a walnut-sized gland that has important functions in the male reproductive system.**
- **With age, the prostate is known for causing problems with urination and pain, as well as cancer.**
- **A number of natural extracts have proven value in preventing and often reversing symptoms of benign prostatic hyperplasia and chronic prostatitis as effectively and with a much better safety profile than existing drug therapies.**
- **Most prostate problems are not cancer-related, and proper supplementation can lead to improved prostate health and fewer risks for problems down the line.**

Pygeum Africanum

Pygeum africanum is a plum tree from tropical Africa.[17] It has been in widespread use in Central and Eastern Europe for decades and numerous human studies have demonstrated the clinical efficacy of *pygeum* in the management of mild to moderate benign prostatic hyperplasia.[18,19] At typical doses of **100 mg** per day, the extract produces significant improvements in International Prostate Symptom Scores of **38%** to **46%**,[19] reductions in frequency of nighttime urination of **32%**,[18] and increases in peak urinary flow rates of **16%** to **19%**.[19] Quality of life, an important measure for this disruptive condition, was increased by about **30%** in two studies.[18,19]

A meta-analysis of 18 randomized, controlled trials involving 1,562 men has shown similar results, with overall reduction in nocturnal urination of **19%** and increased urine flow of **23%**. It also showed that men who took *pygeum* had an important reduction in the volume of urine remaining in the bladder after urination, a major risk factor for urinary tract infections. In that analysis, men using *pygeum* extract were more than **twice** as likely as those using placebo to report an overall improvement in urinary tract symptoms.[20]

Symptoms of Prostate Problems[1]

Regardless of the cause, symptoms of prostate enlargement that can signal prostatitis, benign prostatic hyperplasia, or prostate cancer are similar in their early stages. They include the following:

- More frequent need to urinate
- More urgent need to urinate
- Decreased urine flow or dribbling
- Frequent nighttime awakening to urinate
- Burning with urination

Symptoms of ***prostatitis*** include, in addition to those of general prostate trouble:[1]

- A strong and frequent urge to urinate, even when only a small amount of urine is present
- Chills, fever, low back pain, or body aches
- Pain in the lower abdomen, the groin area, or behind the scrotum
- Pressure or pain in the rectum
- Discharge from the urethra (urinary opening) during bowel movements
- Throbbing in the genital and/or rectal area
- Problems with sexuality and loss of drive
- Painful ejaculation

Symptoms of ***benign prostatic hyperplasia*** include, in addition to those of general prostate trouble:[1]

- Hesitation or difficulty starting a urine stream
- A weak or slow stream of urine, or just a dribble of urine
- Frequent urination, especially at night
- A sense of incomplete emptying of the bladder
- Repeated stopping and starting during a single urination
- Pushing or straining to complete bladder emptying

The symptoms of ***prostate cancer*** are often difficult to distinguish from those of benign prostatic hyperplasia. That means that men with any such symptoms should see their physicians early to allow for proper diagnosis and treatment. Annual PSA screening to detect early-stage prostate cancer is highly recommended.

Additional Nutrients for Benign Prostatic Hyperplasia

Pumpkin seed. Studies have shown that supplementation with pumpkin seed led to clinically relevant reductions in the International Prostate Symptom Scores compared with placebo after three to 12 months.[21,22] One of these studies also showed that the combination of pumpkin seed oil and saw palmetto improved quality of life scores and showed **41.7%** reduction on serum PSA levels at the end of the study when compared to baseline.[22]

Pollen extracts. A meta-analysis of 444 men demonstrated that rye grass pollen extract significantly improved self-rated urinary symptoms in men with benign prostatic hyperplasia. Men in this study were also more than **twice** as likely to report improvement in nocturnal urination compared with placebo, and no side effects were reported.[23]

Flaxseed. Flaxseed is a rich source of dietary **lignans**. In the intestine, they are converted by bacteria into other bioactive compounds, particularly ***enterolactone***. A human study on dietary flaxseed lignan extract demonstrated significant reductions in the International Prostate Symptom Scores and improvements in quality of life in men with benign prostatic hyperplasia.[24]

Prostate Cancer Prevention

Prostate cancer is the second most common malignancy experienced by men,[25] with more than **180,000** American men diagnosed a year, according to the American Cancer Society.[26]

While it can be life threatening, most men do not die from prostate cancer. The five-, 10-, and 15-year survival rates for men diagnosed with prostate cancer are **99%**, **98%**, and **95%** respectively.[27] In fact, it is estimated that more than **2.9 million** American men are living with the disease right now.[26] In addition, it is among the most readily prevented cancers because it tends to grow very slowly and because nutritional approaches to prevention can be **highly effective**.[17]

Let's take a look at five of the most effective nutrients against prostate cancer.

Lycopene

A nutrient with significant potential effects against prostate cancer is ***lycopene***, a bright red carotenoid pigment abundant in tomatoes and other red fruits and vegetables.[28-30]

High consumption of lycopene has been associated with a reduced risk of *developing* prostate cancer—and also with a reduced risk of *dying* from the disease. Among men with more aggressive prostate cancers, above-average lycopene consumption was associated with a **59%** reduction in the risk of dying from the disease![31]

Higher *blood* lycopene levels have also been consistently associated with reduced prostate cancer risk.[32]

Additionally, lycopene inhibits the inflammatory processes that promote prostate (and many other) cancers by suppressing critical "master regulatory molecules" such as nuclear factor-kappa beta (NFkB).[33]

Pygeum Africanum

In addition to combating many of the symptoms of benign prostatic hyperplasia, ***pygeum africanum*** has shown early evidence of potent anticancer effects.

One study found that when mice bred to have prostate cancers were treated with *pygeum* extract, they had significantly lower incidence of developing the malignancy. This same study showed that when

Lycopene May Slow Cancer Progression

Most men by middle age have been offered a blood test for **prostate-specific antigen (PSA)**, which is produced in excessive amounts by prostate cancers and can be effectively used to help identify early-stage malignancy. PSA can also elevate in response to prostatitis and benign prostate enlargement.

Lycopene, the red pigment from tomatoes and other red fruits and vegetables, is one of the few compounds convincingly demonstrated to slow the rise of PSA in men with prostate cancer.

One study showed that, for men with advanced tumors, lycopene plus removal of the testes (to deprive the tumor of growth-promoting male hormones) was superior to surgery alone, with a significant difference in PSA levels by two years after the procedure.[51] Men in this study also had fewer secondary tumors, better relief from bone pain, improved urine flow, and, most importantly, an improved survival rate compared with those undergoing testes removal only.

In another study of men with prostate cancer, **10 mg** of lycopene per day significantly slowed the rate of PSA rise in **70%** of treated men, and in **21%**, turned the rise into a decline.[52]

Since PSA is now known to have direct contributions to prostate cancer growth in addition to serving as a marker for the disease,[43] it seems sensible for men, even without known cancers, to supplement with lycopene as a way of suppressing this important risk factor.

applied directly to prostate cancer cells in culture, *pygeum* extract had numerous benefits, including inhibiting cell proliferation, inducing apoptosis, and binding to androgen receptors used by the tumor to sustain growth.[17]

Another important study showed that serum from a man using *pygeum* extract could decrease the proliferation of prostate cells in culture and upregulated genes involved in tumor suppression.[34]

Three Additional Nutrients to Fight Prostate Cancer

Boswellia extract. Numerous studies on cultured prostate cancer cells have shown that boswellia extract induces tumor death by apoptosis.[35-38] Other studies also show that its components may prevent tumor growth by blocking the androgen (male hormone) receptors[39] and by inhibiting the formation of new blood vessels (angiogenesis), further depriving tumors of nutrients.[36]

Flaxseed. Studies confirmed that flaxseed supplementation lowers PSA levels and significantly reduces the proliferation of normal prostate cells and prostate cancer cells.[40,41] In a clinical study, supplementation with **flaxseed** generated favorable reductions in tumor proliferation rates in men with prostate cancer in as little as 30 days.[41]

Boron. According to one study, men with the highest dietary boron intakes have a **54%** lower risk of developing prostate cancer compared to those with the lowest intake.[42] Boron is known to block certain growth factors necessary for tumor development, and it has also been shown to inhibit the enzymatic action of PSA, which releases those same growth factors from their transport proteins.[43] In an animal study, human prostate cancers implanted in mice were smaller by **38%** following low-dose boron supplementation, while serum PSA levels fell **89%**.[43]

Relief for Chronic Prostatitis

Chronic **prostatitis** is a term used to describe ongoing inflammation of the prostate gland, usually in the absence of any known infection.[1] It is often found as part of a condition known as chronic prostatitis/chronic pelvic pain syndrome, both of which are common in older men and unfortunately difficult to treat with standard medication, leaving men who suffer from this condition in considerable misery.[44-46]

Fortunately, studies show that **rye grass pollen extract** may be a viable approach to treating this challenging condition.

One early study demonstrated that men assigned to receive rye grass pollen extract showed significant improvements in reported pain and quality of life. They also showed improvements on total scores on the **NIH Chronic Prostatitis Symptom Index** scale, compared with placebo.[47]

Subsequent studies found similar results, with more supplemented subjects reporting significant improvements in quality of life and symptom scores.[48,49]

None of these studies identified significant side effects, which suggests that rye grass pollen is both safe and effective in the treatment of chronic prostatitis, a stubborn condition that has resisted other treatment approaches.

Summary

The human prostate is a small gland with an enormous impact on a man's health. Most of its functions are important in reproductive activity, but problems tend to arise later in life.

The most common prostate problems include benign prostatic hyperplasia, chronic prostatitis, and prostate cancer. Treatments, when available, vary in effectiveness and carry considerable side effects.

A large handful of dietary supplements has shown real promise in reducing the impact of prostate disease. While no single supplement can provide complete coverage against potential problems, those discussed here have overlapping mechanisms of action. This suggests that, taken in combination, they can contribute to reducing the risk of prostate disease, and many have been shown to help reverse the most troubling symptoms.

Starting a comprehensive prostate health supplement regimen is the smart thing to do, even (and especially) before symptoms arise. ●

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

Drugs to Treat Benign Prostate Hypertrophy (BPH) and Reduce Prostate Cancer Risk

Life Extension® has long advocated the use of certain **prescription drugs** to further reduce symptoms of benign prostatic hyperplasia, shrink enlarged prostate glands, and lower prostate cancer risk.

One class of drugs that aging men should consider are *5-alpha reductase* inhibitors that function to decrease the conversion of testosterone into more powerful **dihydrotestosterone** (DHT).[2]

We have published meticulous reviews showing the value with the judicious use of **Avodart**® (dutasteride) or **Proscar**® (finasteride). A small percentage of men suffer sexual side effects from these medications, but they should be considered in addition to nutrients described in this article when symptoms of benign prostatic hyperplasia do not sufficiently resolve. To review what we have previously published about Avodart® or Proscar® in the prevention of prostate cancer, log on to LifeExtension.com/prostate

A drug that was extensively advertised on television that can reduce benign prostatic hyperplasia symptoms by facilitating complete emptying of the bladder is **Flomax**®, available as a generic under the name **tamsulosin**. The urinary/sexual side effects stated on the television commercials sounded hideous, yet we hear from men using this drug that they do not encounter these side effects and attain significant benefit.

So if one is troubled with benign prostatic hyperplasia symptoms that are not sufficiently resolved with nutrients and *5-alpha reductase* inhibitors, it makes sense to try **tamsulosin**. If side effects outweigh the benefits, then discontinue this drug. One side effect from this medication is that it can lower blood pressure.[50]

Life Extension® strongly recommends that all people purchase a low-cost **at-home blood pressure monitor** so they can check themselves when they try new medication and what effect it is having on their blood pressure.

Most natural health publications demonize most all prescription drugs because so many of them have horrific side effects and minimal efficacy. Life Extension® has published numerous articles exposing fraudulent approvals of deadly drugs that should be avoided.

What distinguishes **Life Extension**® is our analysis of data about prescription drugs whose beneficial effects outweigh side effect risks. **Metformin** is one example of a prescription drug that when properly used, may have profound age-delaying benefits.

Prostate prescription drugs, likewise, can provide additional benefits for men whose benign prostatic hyperplasia is not completely resolved with natural approaches.

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BY ROBERT GOLDFADEN AND GARY GOLDFADEN, MD

Topical VITAMIN C for Skin Rejuvenation

With advancing age, your skin progressively loses vitamin C.[1] That spells trouble for the skin's underlying architecture, resulting in visible wrinkles, age spots, and fine lines.

Vitamin C supports firm and youthful skin by boosting collagen synthesis,[2,3] decreasing photodamage,[4,5] and exerting anti-inflammatory activity.[6]

In this article, you will learn about three of the *most* stable forms of vitamin C—and how their diverse biological activities in the skin protect against photoaging and common skin disorders to leave behind a more youthful appearance.

More Stabilized Forms of Vitamin C

Since humans lack the enzyme necessary for synthesizing vitamin C, they must obtain it through oral ingestion or topical application.[7] Topical application has shown to be superior for replenishing skin concentrations of vitamin C.[6]

Scientists have identified three vitamin C derivatives—**magnesium ascorbyl phosphate, sodium ascorbyl phosphate,** and **ascorbyl glucoside**—with improved stability that efficiently convert to L-ascorbic acid in the skin to leave it firmer, healthier, and more youthful.[8,9]

Prevent and Repair Sun-Damaged Skin

Chronic exposure to the damaging rays of the sun induces unfavorable changes to the skin's structural framework, leading to premature aging visible as wrinkles, age spots, and spider veins.[10,11] Research indicates that all three stable forms of vitamin C protect against sun-induced aging (photoaging) by:

- **Scavenging reactive oxygen species** that increase the expression of enzymes responsible for breaking down collagen and elastin—the proteins comprising most of the structural framework that keeps skin firm and resilient.[12,13]
- **Inhibiting lipid peroxidation** that damages membranes of the skin cells and alters their functional integrity.[14,15]
- **Reducing the inflammatory response** to ultraviolet radiation that triggers DNA damage, programmed cell death by apoptosis, and immunosuppression.[12,16]

In addition to protecting against the harmful effects of ultraviolet rays, these three forms of vitamin C also initiate the **repair process** of sun-damaged skin. They are broken down to L-ascorbic acid, which acts as a co-factor in enzymatic reactions responsible for stimulating new production of **collagen** that boosts the skin's healing capacity.[17]

Owing to its unique molecular structure, each form of vitamin C stands out from the rest for a specific skin benefits. Let's now take a look at how each of these ascorbate compounds benefit the skin.

Magnesium Ascorbyl Phosphate Restores Skin Hydration

As the years pass, our skin loses its ability to retain **moisture**. This happens as the skin's barrier function weakens under the assault of ultraviolet radiation and environmental stressors. The result is dry, flaking, and crepey skin.[18] Research has shown that **magnesium ascorbyl phosphate** (MAP) enhances the skin's ability to retain water, in turn making it visibly softer and smoother.[19,20]

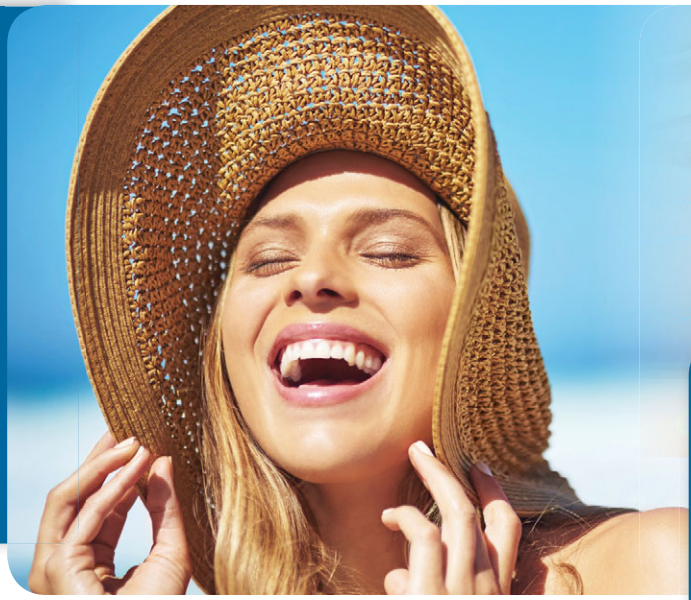
In a controlled clinical study, human volunteers applied topical magnesium ascorbyl phosphate to their forearm skin daily for four weeks. Researchers used two techniques called *corneometry* and *cutometery* to objectively measure skin hydration. By these measures, magnesium ascorbyl phosphate significantly increased hydration in both the outer and deeper layers of the skin, thereby demonstrating sustained effects.[19] This finding was later confirmed in yet another trial.[20]

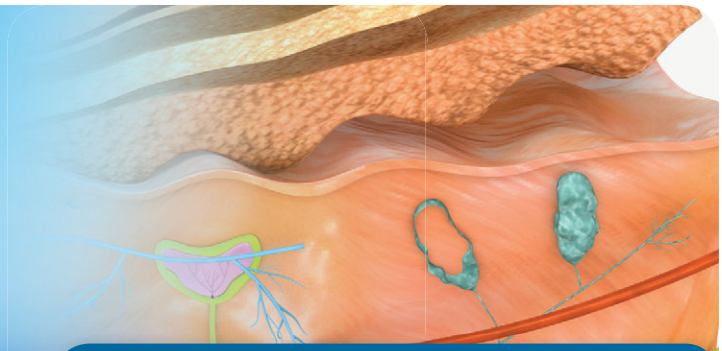
Ascorbyl Glucoside Fades Excess Pigmentation

Hyperpigmentation reflects the abnormal output of the skin's main pigment melanin.[21] This creates an uneven skin tone that can add years to your appearance. To make matters worse, effective treatments are accompanied by undesirable side effects.[22,23]

Human studies have shown that **ascorbyl glucoside** safely modulates common forms of hyperpigmentation such as age spots and difficult-to-treat melasma.[24-26] This stems from its ability to block the action of tyrosinase, a key enzyme involved in the formation of new melanin.[27,28]

What You Need to Know





Stabilized Forms of Vitamin C Revive Aging Skin

- **Vitamin C in its active form as L-ascorbic acid has multiple skin benefits, but its susceptibility to oxidation limits stability in topical preparations.**
- **More stabilized forms of vitamin C have been identified to provide beneficial effects on the skin.**
- **Magnesium ascorbyl phosphate, sodium ascorbyl phosphate, and ascorbyl glucoside work through several ways to prevent and repair sun-damaged skin, increase hydration, and combat common skin disorders like age spots and acne.**
- **When combined with ferulic acid into a topical formulation, the result is a visible improvement in the health and appearance of your skin.**

In one clinical trial, patients aged 30 to 50 suffering from facial hyperpigmentation applied a topical formula comprising ***ascorbyl glucoside*** to one side of their faces daily for four weeks. At the end of the study, the treated side of the participants' faces showed a significant reduction in total area of hyperpigmented spots. Additionally, **70%** of subjects treated with ascorbyl glucoside reported lighter skin compared to **16.6%** in the untreated group.[25]

In another study, scientists enlisted volunteers who applied a cream containing **ascorbyl glucoside** to their face twice daily for three months. The total area of age spots was assessed at baseline, and then 14, 28, 56, and 84 days after application. Researchers observed that within two weeks, total area of age spots decreased by an average of **14.2%**, and after three months, this parameter further improved to **21.2%**.[26]

Sodium Ascorbyl Phosphate Alleviates Acne

Although acne is associated with younger individuals, this inflammatory skin disorder affects **15.3%** of women and **7.3%** of men aged 50 and older.[29] The development of acne is characterized by the excessive production and oxidation of sebum—the skin's natural oil—that generates inflammation and is a breeding ground for bacteria called *Propionibacterium acnes* (*P. acnes*).[30] This culminates in inflamed blemishes and lesions on the skin.

Sodium ascorbyl phosphate gained traction as a potential treatment for acne after it was found in laboratory investigations to strongly inhibit the growth of *P. acnes* and prevent sebum oxidation by up to **40%**.[31] The next step was to determine its efficacy in humans.

In a randomized, double-blind, controlled trial, 50 patients with mild to severe acne applied **sodium ascorbyl phosphate** or a placebo twice a day to their acne lesions for 12 weeks. Scientists found that treated patients saw greater improvements on several acne rating scales. Also, the treatment group's lesion count decreased by **21%**—while the placebo group's diminished by **7%**.[32]

Researchers then tested sodium ascorbyl phosphate versus benzoyl peroxide—a widely prescribed and effective acne treatment agent—on acne patients over a 12-week period. They discovered that twice-daily application of **sodium ascorbyl phosphate** resulted in good or excellent skin improvement in **76.9%** of patients, compared to **60.9%** in the benzoyl peroxide group. The research team concluded that sodium ascorbyl phosphate has *"excellent efficacy in the treatment of acne vulgaris."*[31]

Ferulic Acid Enhances Vitamin C Effects

The potent free radical scavenger **ferulic acid** often makes an appearance alongside vitamin C in topical preparations and for good reason. It has been shown to slow the breakdown of vitamin C and enhance its protective effects against ultraviolet damage. When added to a combination of vitamin C and E, ferulic acid doubled photoprotection, increasing it from **4-fold** to **8-fold**.[33]

Summary

Vitamin C in its primary form of L-ascorbic acid has a proven track record for improving aging skin. Scientists have now identified more stable forms of vitamin C including:

1. **Magnesium ascorbyl phosphate**
2. **Sodium ascorbyl phosphate**
3. **Ascorbyl glucoside**

These advanced forms of vitamin C have been combined with **ferulic acid** into a topical formulation that offers comprehensive protection against photoaging and combats common skin disorders to restore youthful skin. ●

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

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

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Cistanche

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- Helps reduce biomarkers of immune senescence.[3]

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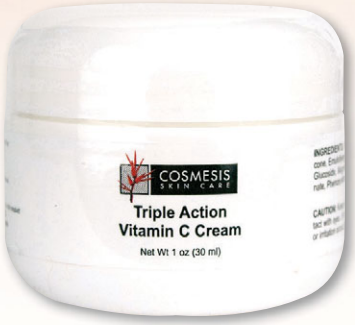
- Restore skin hydration,[5]
- Help inhibit discoloration of the skin,[3] and
- Help alleviate skin blemishes[6]



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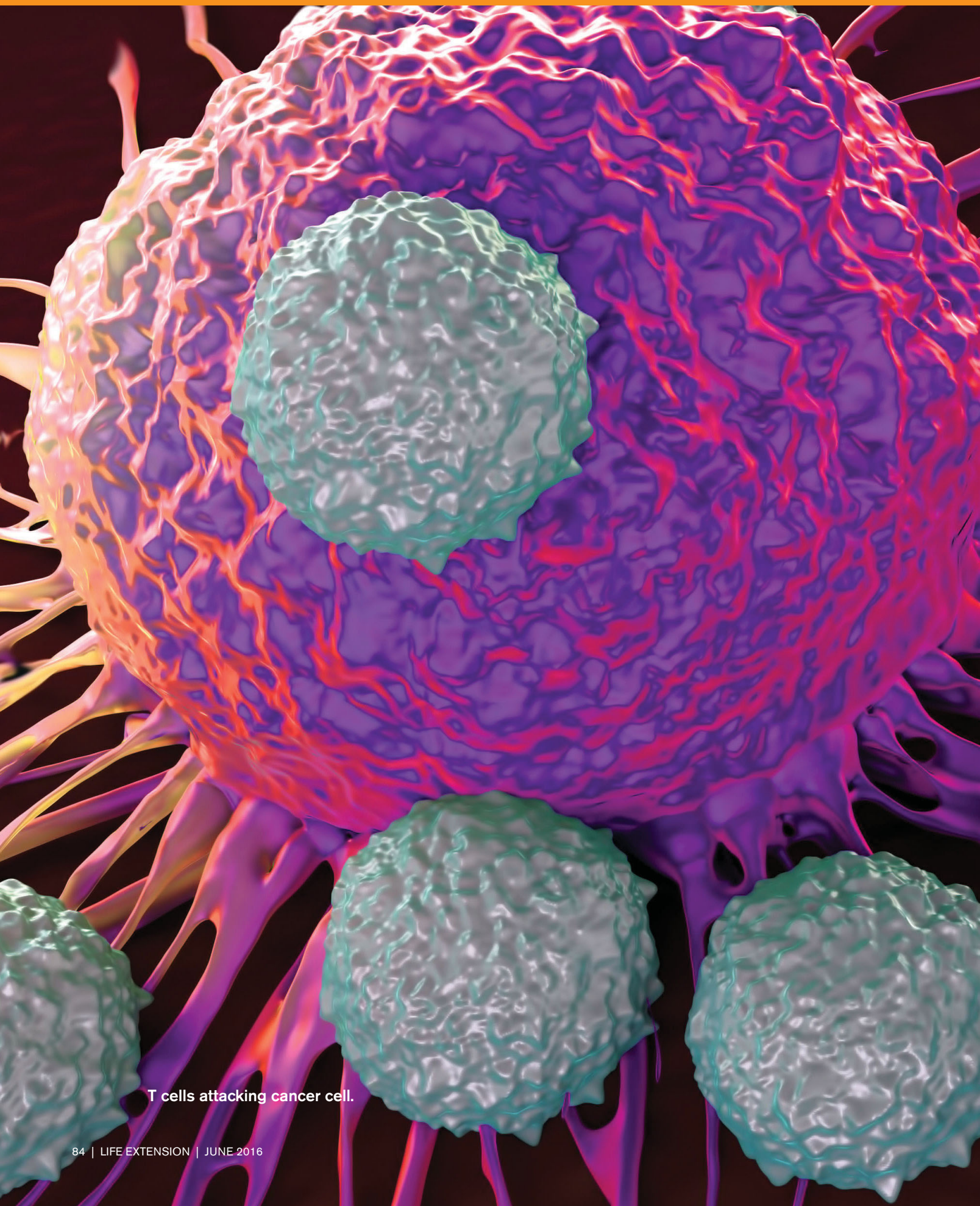


T cells attacking cancer cell.

BY CHANCELLOR FALOON

TECHNICAL ONCOLOGY UPDATE AND OPINION

Immune-Modulating CANCER DRUGS *Finally* Get Some Respect

Cancer kills more than **1,600** Americans every day.[1]

When an effective cancer drug is delayed by even a few months, the death toll can run into the **tens of thousands**.

When the delay is measured in decades, the number of needless cancer deaths escalates into the **millions**.

In **1996**, a remarkable study was published in the prestigious journal ***Science***.[2] Two groups of mice with tumors were tested in the experiment. One group received a novel **immunotherapy** that resulted in eradication of tumors and **immunity** against a second tumor exposure.

The group of mice that did not receive the immunotherapy had to be euthanized because their tumors had grown out of control.

Instead of greeting this discovery as a potential treatment breakthrough, the medical establishment's response was rather apathetic.

Nearly two decades later, immunotherapy drugs that work by this mechanism are garnering headlines around the world.

You're seeing these drugs advertised as being able to add longer life to advanced-stage cancer patients. Brand names include **Yervoy®**, **Opdivo®**, and **Keytruda®**.

Former President **Jimmy Carter** credits one of these drugs (Keytruda®) with helping induce a remission to his advanced-stage melanoma. (The media used the word "cure," but this is not accurate.)[3]

We at **Life Extension®** are appalled as to the length of time it took for cancer patients to access this class of immunotherapy. These drugs displayed remarkable results in animal models, yet it took too long for this class of drug to gain widespread recognition in the oncology mainstream.

These new immunotherapy drugs are not without serious side effects.[4] Efficacy varies considerably based on the genetic makeup of the tumor. These drugs work by tearing down defenses tumors erect against immune cell eradication.

There is evidence indicating that judicious use of these drugs in ***earlier-stage*** cases combined with immune-augmenting drugs like low-dose **interleukin-2** might increase the number of remissions, complete responses, and outright cures of metastatic malignancies.[5]

This editorial describes cancer treatments that are not being optimally utilized, pointing to the urgent need for cancer patients to gain quicker access to new and potentially better therapies.

Sparking an Immune Alert against Cancer

The dilemma that exists with many malignancies is that the cancer itself can "trick" the body into pretending there is no cancer present. In other words, it's not that the body doesn't have the ***ability*** to defend itself; the problem is the body doesn't know what it needs to defend against. If the immune system could identify the cancer early on, the resulting immune response might defeat the malignancy in many cases.[4,6-8]

Some T cells contain receptors that are actively searching for unhealthy cells to destroy. Cancer cells can evade T cell immune destruction by shielding themselves with high amounts of a ligand called "**programmed death ligand 1**," or **PD-L1.**

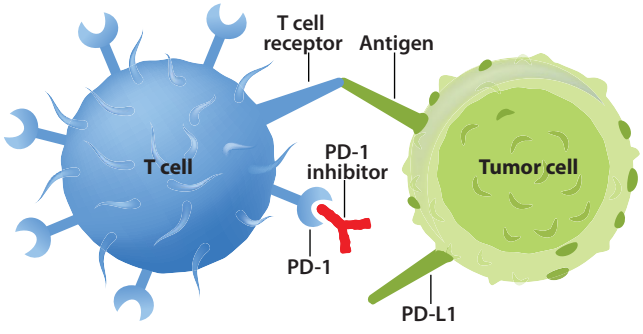
Ligands are molecules that bind to other molecules. **PD-L1** binds to receptors on our body's **T cells**. When **PD-L1** binds to immune **T cell PD-1 receptors**, it hacks and tricks the T cell into thinking there is no cancer present in the cell.

PD-L1 thus inhibits T cells from creating an immune attack necessary to destroy the cancer.

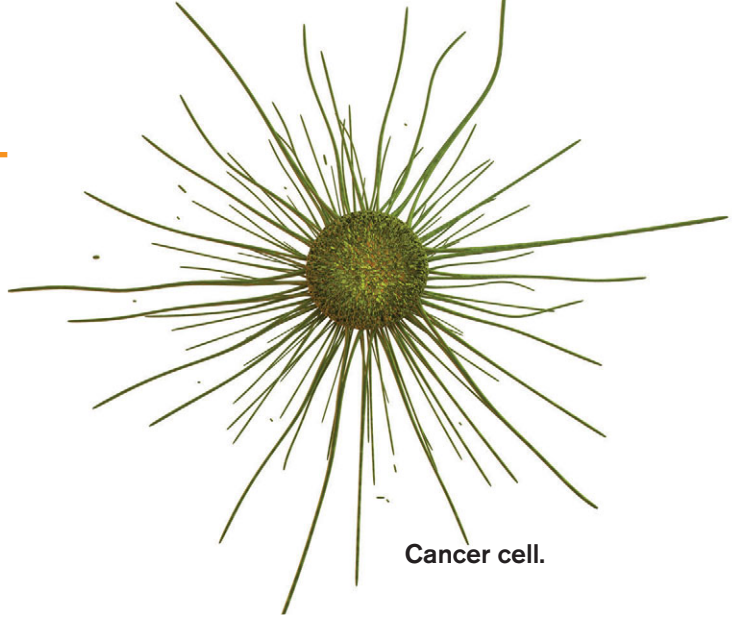
The new immunotherapy drugs (described previously) attach to the PD-1 receptors on T cells. These drugs are called **checkpoint inhibitors** because they block a tumor cell checkpoint by preventing **tumor cell PD-L1 ligand** from attaching to the **PD-1 receptor** on the body's **T cell membranes**. These **checkpoint inhibitor** drugs neutralize the ability of certain tumor cells to shield themselves against T cell immune attack.[4,6-8]

Yervoy®, Opdivo®, and Keytruda® are the **checkpoint inhibitors** approved today. Despite published research dating back to **1996** showing the efficacy of these drug's mechanisms,[2] stifling bureaucracy delayed development and clinical testing. The result is that these lifesaving drugs have only painstakingly gained approval for certain cancers in years 2011-2015. (They are still not approved for the majority of cancers) [9-12].

How Checkpoint Inhibitors Block Tumor Cells



PD-1 expressing from a T cell and **PD-L1** expressing from a cancer cell. The **checkpoint inhibitor** drug blocks the binding of PD-1 to PD-L1, thus preventing the cancer cell from using this mechanism to shield itself against immune attack.



Cancer cell.

Role of Gene Mutations in Cancer

One way cancer develops is as a result of the accumulation of mutations in genes that regulate cellular proliferation. Specific mutations in certain genes increase cancer risk.[13]

For instance, if there is a mutation in the **BRCA** gene, it increases one's risk of breast cancer.[14] A mutation in the **BRAF** gene can lead to uncontrolled growth of melanocytes causing a melanoma.[15]

Risk factors such as sunlight, ionizing radiation, heavily cooked food, and smoking cause gene mutations.[16,17] A genetic mutation can also occur because of errors during DNA replication.[18]

The More Gene Mutations, the Better

A **gene mutation** is usually considered undesirable because it can cause or contribute to a wide range of diseases. Cancers with many gene mutations are often more difficult to treat because they have more survival options to escape eradication.[19]

When it comes to the new **checkpoint inhibitor** drugs such as **Keytruda®** and **Opdivo®**, however, researchers made an unusual discovery. It turns out that cancer cells with the most **gene mutations** respond far more favorably to treatment with this class of drug.[20]

For instance, Opdivo® (nivolumab) was given to a group of patients who had non-small cell **lung cancer** with ***high*** levels of **mutations**. The response rate was **73%** compared to **13%** for those who had low amounts of mutations.[20,21]

One way the immune system detects cancer cells is because of their **mutations**, which make the tumor cells appear as a foreign body. Tumor cells with more mutations are more effectively treated with **checkpoint inhibitor** drugs since these tumor cells create more antigens that attract T cells. If the cancer did not have many genetic mutations, then treatment using these new drugs is less effective.

Improved Survival Using Opdivo®

Melanomas make up the majority of skin cancer deaths even though they only account for **1%** of skin cancers. If melanoma is detected early and has not spread, then survival rates are relatively high. Stage IV (metastatic) melanoma has a very low survival rate.[1]

Recent studies have shown the checkpoint inhibitor **Opdivo®** offers a more favorable prognosis than the conventional treatments that have been used for decades.[4,22-26]

The New England Journal of Medicine released a study in **2015** comparing Opdivo® to the chemotherapy drug **dacarbazine** in 418 metastatic melanoma patients. The survival rate after one year was **72.9%** for those who received **Opdivo®** compared to only **42.1%** for those who received **dacarbazine**.[22]

In addition, there were (slightly) fewer treatment-related adverse effects for those who received **Opdivo®**. Of those who received Opdivo®, **6.8%** had to discontinue treatment compared to **11.7%** for those who used dacarbazine.[22]

Shortly after this study was released, Opdivo® was tested in two different studies. The first was on advanced squamous-cell non-small-cell lung cancer involving 272 patients previously treated and whose disease had progressed; the second involved 582 patients with advanced non-squamous non-small-cell lung cancer. Researchers compared Opdivo® to the chemotherapy drug docetaxel in both studies.[23,24]

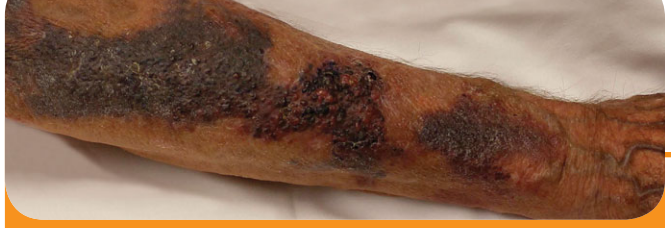
After 12 months, the survival rate for the squamous-cell non-small-cell lung cancer study was **42%** in the patients who received Opdivo® compared to **24%** for the patients given docetaxel.[23]

At 18 months, the survival rate for the non-squamous non-small-cell lung cancer study was **39%** in the patients who received Opdivo® compared to **23%** for the patients given docetaxel.[24]

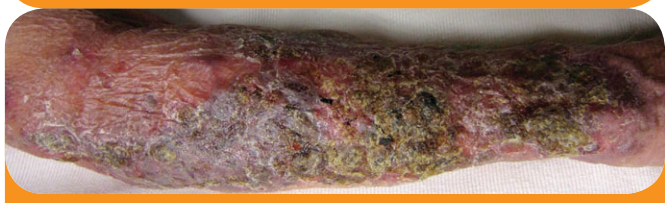
What You Need to Know

Misplaced Priorities

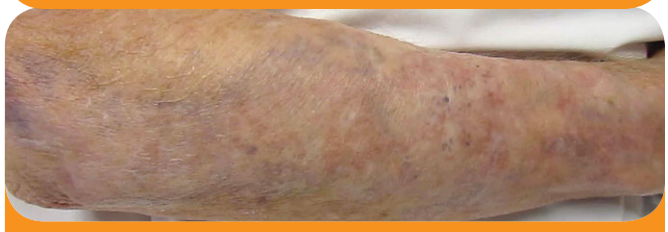
- **Immunotherapy drugs—or checkpoint inhibitors—have proved effective at treating late-stage cancers. Yet their immune-modulating mechanism was published 20 years ago.**
- **These drugs, Yervoy®, Opdivo®, and Keytruda®, are more effective on cancer cells with the most gene mutations. In one study, the response rate on patients with non-small cell lung cancer with high levels of gene mutations was 73%.**
- **Interleukin-2 enhances natural killer cell activity. Pretreatment with interleukin-2 by itself dramatically improved clinical outcomes in pancreatic cancer patients.**
- **Bureaucratic delays and regulations delay dying patients access to innovative treatments.**
- **World-renowned physician Dr. Vincent DeVita is calling for a new and improved National Cancer Act that will take clinical cancer trials away from the FDA and place them with National Cancer Institute cancer centers as a way to eliminate delays and end inane regulations.**



Patient presenting with cutaneous melanoma.



Same patient during treatment phase of IL-2, imiquimod, and vitamin A drug (redness is indicative of immune attack).



Same patient 31 months after receiving IL-2, imiquimod, and topical vitamin A.

Results with Yervoy® and Keytruda®

Keytruda® (**pembrolizumab**) is showing results indicating it may be more effective than **Yervoy®** (**ipilimumab**) for metastatic melanoma patients. A detailed study compared the two drugs, as well as their dosing, on an average of 278 patients in each group. Those who received Keytruda® had a one-year survival rate of **74.1%** compared to **58.2%** for Yervoy®. It is important to note that **34%** of all these patients had previously received other systemic therapies.[27]

The response rate refers to the percentage of patients whose cancer disappeared or shrunk after treatment.[28] The group that received **Keytruda®** had a response rate of **33.7%** compared to only **11.9%** for **Yervoy®**. The best results were seen when Keytruda® was used every two weeks at a dose of **10 mg per kilogram of body weight**. The Keytruda® treatment was also associated with less severe side effects.

Strengthening the Immune System

Interleukin-2 (IL-2) enhances overall immune function, most notably by enhancing **natural killer cell** activity.[29-31]

Interleukin-2 can be highly effective when delivered before immune-suppressing conventional therapies. A number of studies reveal that pretreatment with **interleukin-2** before a standard cancer treatment protocol can improve clinical outcomes.[32-35]

Pancreatic cancer has the lowest survival rate of most any form of cancer.[1] Only **15%** to **20%** of pancreatic cancer patients are eligible for a complex surgery that involves the removal of the head of the pancreas and other digestive organs.[36] This horrific surgery, known as the Whipple procedure, has a mortality rate of **15%** and a five-year survival rate of only **10%**.[37]

A study released in the journal *Hepato-Gastroenterology* revealed that when moderate-dose **interleukin-2** was administered before the Whipple procedure, the survival rate after three years was **22%** compared to **0%** in the group that did not receive interleukin-2.[38]

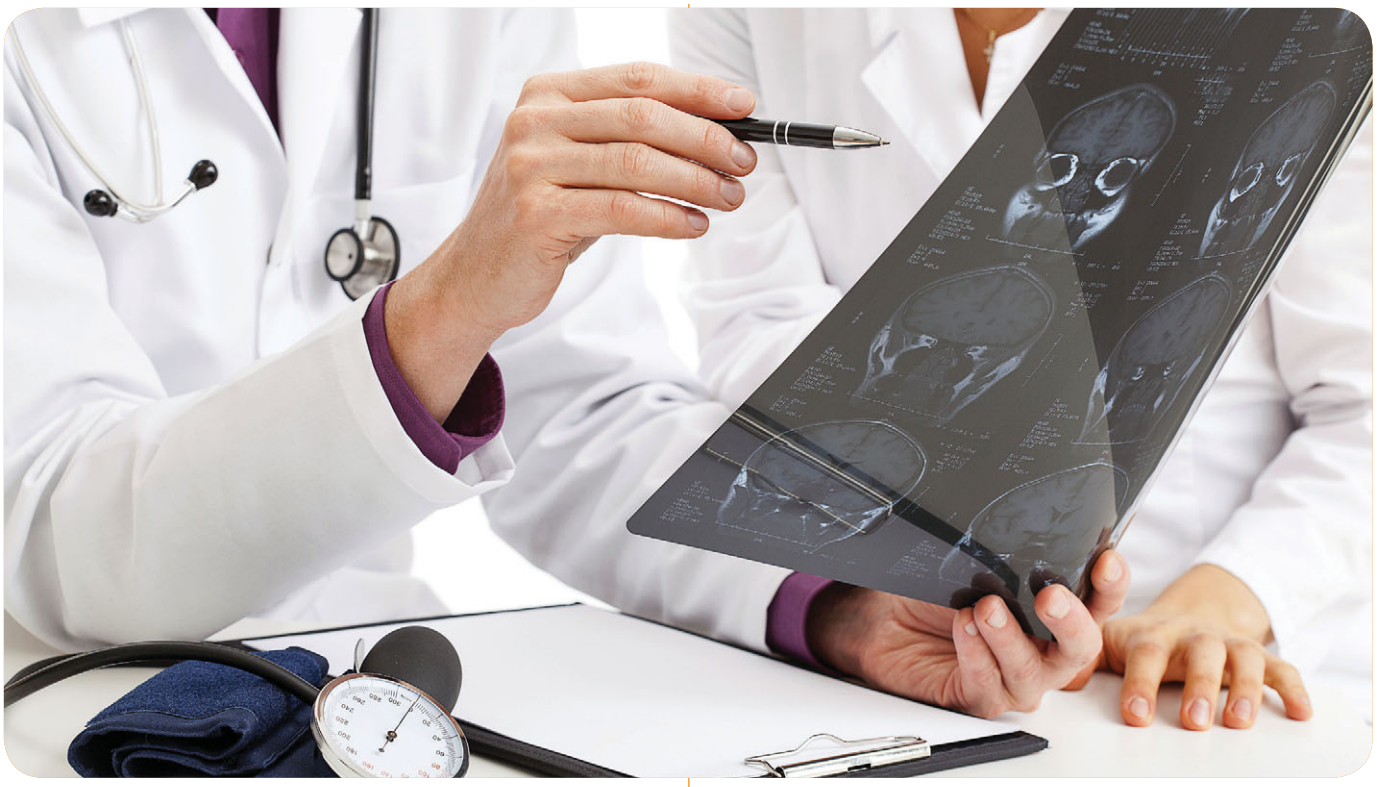
In 2015, the *Journal of the American Academy of Dermatology* reported on another study that used interleukin-2 and other immune boosters. Eleven patients with cutaneous (skin) metastatic melanoma were given injections of **interleukin-2** directly into skin lesions along with applications of the drug **imiquimod** and a topical **vitamin A** drug (tazarotene).[39]

All 11 patients had a **100%** complete response rate from this three-drug combination (interleukin-2, imiquimod, vitamin A). Biopsies confirmed that there was an absence of malignant cells in the treated areas. Two-year survival rate was **82%** in these patients receiving the three-drug combo.[39]

The results of this study were so impressive that the study was included in the *US National Comprehensive Cancer Network* guidelines.[39]

Synergistic Combination of Interleukin-2 and Checkpoint Inhibitors

Checkpoint inhibitors and interleukin-2 have unique mechanisms of action on the immune system. The checkpoint inhibitors break down shields that cancer cells erect against immune attack while interleukin-2 promotes natural killer cell immune activity.



It is therefore logical to speculate that the combination of **interleukin-2** and a **checkpoint inhibitor** drug would be more effective than either drug alone.

A recent study supports this hypothesis.[5] In this study, mice were first injected with immune-resistant melanoma cells to infiltrate the mouse's body similar to metastatic melanoma in humans.

Researchers then tested interleukin-2 alone, cytotoxic T lymphocyte antigen 4 (CTLA-4) blockade (checkpoint inhibitor like **Yervoy**®) alone, or a combination of interleukin-2 and CTLA-4 blockade on these mice. The results were prolonged survival and significantly delayed tumor growth in the mouse group getting both drugs (interleukin-2 and checkpoint inhibitor).[5]

In the control group, tumors reached a size of **76 mm²**. In the mice that received **interleukin-2** alone, tumor growth was **29 mm²**.

By contrast, the **checkpoint inhibitor** group's tumors grew by **14 mm²**, which was only half the size as the mice treated with **interleukin-2** alone.[5]

What is astonishing is the mice that received **interleukin-2** and the **checkpoint inhibitor** combination had a tumor growth of only **2 mm²**. This combination was **seven** to **14 times** more effective than treatment with either drug alone.[5]

At day 23, there was **100% survival** in the group receiving the interleukin-2 and checkpoint inhibitor combination compared to **30%** survival in the **interleukin-2-only** group and **50%** survival in the **checkpoint inhibitor-only** group. Control-treated mice were all dead by day 23.[5]

This study, along with a cumulative knowledge of the mechanisms of action of **interleukin-2** and **checkpoint inhibitors**, indicates that the combination of these two immunotherapies might be suitable to study in human metastatic patients.

Fighting Brain Tumors

Researchers at Duke University are conducting trials on an innovative therapy that uses a genetically engineered **poliovirus** to fight **glioblastoma**.[40,41]

Scientists have removed a specific genetic sequence from the poliovirus and replaced it with an innocuous part from the rhinovirus. This completely changes the structure of the poliovirus into an **oncolytic virus**, which is a virus that attacks cancer cells.[42,43]

This genetically engineered poliovirus naturally targets cancer cells since the receptor for poliovirus is abnormally present in most tumor cells. This oncolytic or "cancer-fighting" virus only kills cancer cells because their ability to grow depends on the biochemical abnormalities that are only present in cancer cells.[41]

A report on *60 Minutes* about the use of this poliovirus treatment on glioblastoma brain tumor patients was nothing short of astounding. The genetically

engineered poliovirus extended the lives of most of the patients. Some glioblastoma patients appeared to go into a complete remission, with no evidence of residual remaining tumor.[44]

The researchers are conducting further studies and are enrolling all glioblastoma patients who meet eligibility criteria. In less than a year, the FDA is expected to make a decision on approving this immunotherapy for glioblastoma patients.[44]

Immunotherapy Prevents Breast Cancer Metastasis

A therapy called **photodynamic immunotherapy** (PDIT) was described in the November 2012 and September 2015 editions of *Life Extension*® magazine.

This immunotherapy works by first delivering a photosensitizing agent to the breast tumor. This enables the effects of a laser to be amplified in a way that destroys the primary tumor. The agent used also enables the immune system to mount a response against infiltrative or metastatic tumor cells. In addition, it breaks down cancer's defense mechanisms that would otherwise thwart immune attack.[45,46]

When this therapy was studied on 15 breast cancer patients, survival rates were comparable or exceeded that of conventional treatments, which utilize mastectomy, radiation, and chemotherapies. What makes photodynamic immunotherapy newsworthy is that it is has no serious side effects.[47]

Current studies are testing photodynamic immunotherapy for prostate, lung, melanoma, and other advanced cancers. If you would like more information on the availability of photodynamic immunotherapy, please call the International Strategic Cancer Alliance (ISCA) at 1-610-628-3419.

How Regulations Create Delays

In **1971**, the United States government enacted the ***National Cancer Act***.[48] It is almost half a century later and more than 1,600 Americans die of cancer every day.[1]

Dr. Vincent DeVita is a world-renowned physician. He has served as the director at the National Cancer Institute, physician-in-chief at Memorial Sloan Kettering Cancer Center, director of Yale University's Cancer Center, and president of the American Cancer Society.[49]

Dr. DeVita writes, "***The real impediment in the war is the regulatory environment and an outdated infrastructure for it, created well before we knew much about the disease***."[49]

The ***National Cancer Act*** was a step closer to the cure for cancer, but it wasn't good enough.

The act attempted to shift the power of drug approval from the FDA to the National Cancer Institute, but instead the FDA became a roadblock for patients awaiting new drugs.


Dr. Vincent DeVita

The National Cancer Act of 1971 also established cancer centers in universities, but they too often became entangled with academic politics and grants.

According to Dr. DeVita, cancer centers founded by the National Cancer

Institute (NCI) should be allowed to practice independently. The authority to prioritize clinical trials needs to be taken away from the FDA and given to these NCI cancer centers.[49]

Dr. DeVita calls for a new National Cancer Act. He asserts that we have amassed the scientific knowledge, but bureaucratic **regulations** need to be circumvented to more effectively develop curative therapies.

We at ***Life Extension***® have long concurred with what Dr. DeVita is now publically calling for, i.e. an end to inane regulations that hinder development of novel cancer treatments.

Summary

The delay of effective drugs translates to millions of needless deaths.

The efficacy of immunotherapy drugs (Yervoy®, Opdivo®, and Keytruda®) that target the genetic makeup of a tumor dates back to **1996**, yet even today, they've only gained approval for use in a small number of cancers.

These drugs are known as **checkpoint inhibitors**, and when they are combined with **interleukin-2**, survival rates increase even more dramatically in the mouse model.

A Duke University study of genetically engineered poliovirus has shown outstanding results on glioblastoma patients.

These advances have managed to occur (slowly) despite bureaucratic roadblocks that innovative researchers must contend with. ●

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

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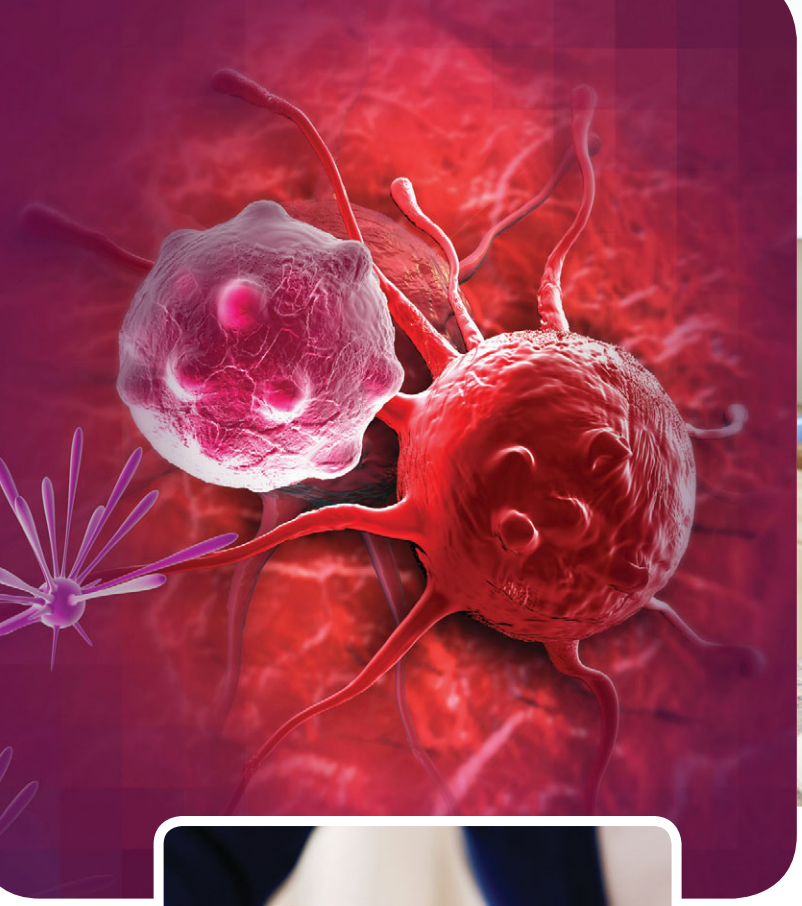
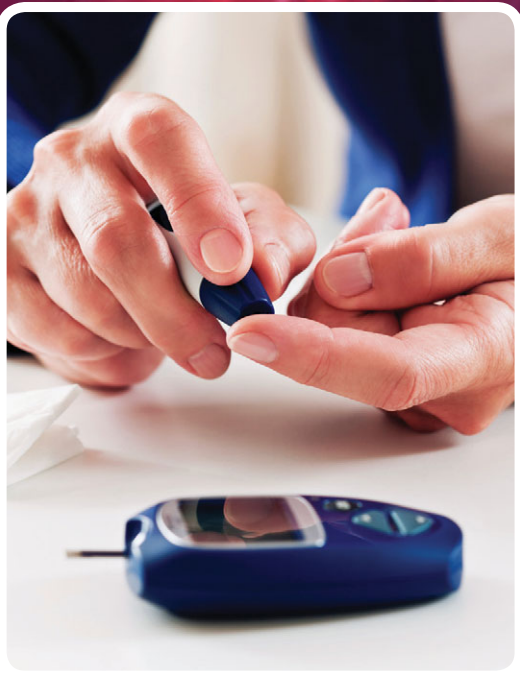




The Insulin/Cancer CONNECTION

BY MILES MUELLER

Most people recognize **insulin** as a beneficial hormone. It helps remove **sugar** (glucose) from the blood into cells where it is used to power energy or is stored as surplus **fat**.

For years, Life Extension® has discussed the role of excess insulin as a culprit involved in **metabolic syndrome**, which increases degenerative disease risk. In particular, high levels of insulin are now recognized as important contributors to the development and progression of many kinds of cancer.[1-3]

How has such a vital, natural hormone been converted from life-supporting friend to deadly foe?

The answer lies with the nation's love affair with calories, particularly those derived from simple sugars and refined carbohydrates. Americans eat so many of these dangerous foods that **50%** are overweight, **30%** are obese, and **10%** already have type II diabetes.[2]

Studies in the past decade have revealed a close connection between body size, type II diabetes, and many cancers.[2,3] For example, consuming a diet rich in readily digested sugars and carbohydrates increases the risk of developing the most common form of breast cancer by **36%** to **41%**.[4]

A consistent finding across a broad spectrum of common malignancies reveals that higher blood **insulin**, often caused by chronically elevated blood **glucose**, results in increased cancer risk.

For example, **prostate cancer** incidence is **2.55-fold** greater in men with the highest blood **insulin** levels.[5]

The Emerging Connection between Obesity, Insulin, and Cancer

As people gain weight, their fat cells begin to pour out cytokines that generate inflammation throughout the body.[3,6] This leads to the phenomenon called "insulin resistance," in which cells lose their ability to move glucose from the blood and into cells under the influence of normal blood levels of insulin.[3] As a result, sugar levels rise, triggering further increases in insulin release from the pancreas. Insulin-resistant cells cannot respond, leading to still higher glucose and higher insulin levels in a vicious cycle.[2]

Eventually, a state of type II diabetes develops, but elevated insulin levels are found in a very large number of people not yet diagnosed with the disease.[7,8] And that's dangerous.

Because insulin is a growth factor, high insulin levels in cells trigger more rapid cell division, while elevated sugar and fat levels provide more metabolic fuel.[3,4] Along the way, some cells lose control of their DNA regulatory genes, which is the hallmark of malignancy. This sequence of events is now thought to contribute to the promotion of cancer, at least in colon cells and probably in those throughout the body.[3]

Research Documents Insulin's Role in Cancer Models

Diabetes and resulting elevated insulin levels are associated with increased risk of many kinds of cancer, as well as with development of more aggressive and metastatic cancers that carry a grim prognosis.[9,10] Mechanisms for this deadly trend have emerged from laboratories around the world in just the past few years.

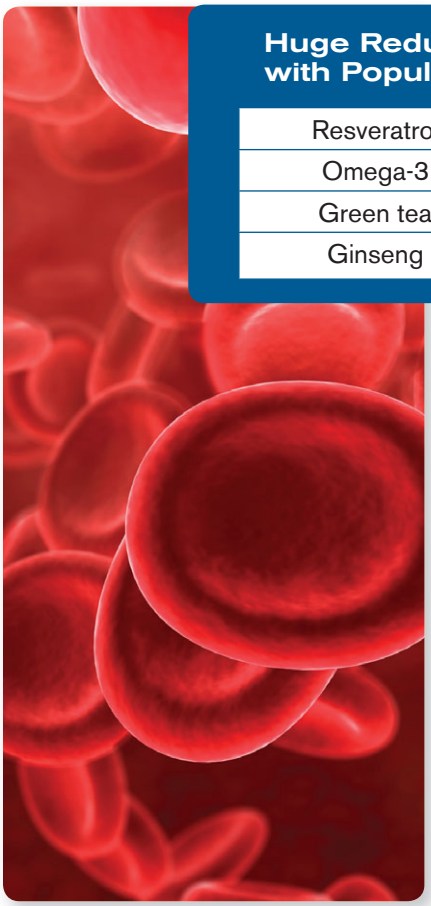
One of the most fundamental pathologies recently elucidated is damage to DNA, often the first step in cancer development. Even very tiny amounts of insulin, applied a single time to cell cultures, generated sufficient toxic oxidative stress to damage DNA strands.[10,11] Prolonging exposure for six days reduced the concentration of insulin required to induce such damage by a factor of 10, demonstrating the extreme risks of chronically elevated insulin in the body.[11]

As a growth factor, insulin naturally stimulates cell growth. But too much insulin results in overstimulation once a cancer cell has emerged, promoting proliferation, migration, and invasiveness of cancer cells by means of multiple fundamental biochemical signaling pathways.[9,12]

A vivid demonstration of the cancer-promoting effects of insulin comes from a study of mice that had been injected with colon cancer cells and then fed either a normal or a high-calorie diet. Tumors in the high-calorie group grew to twice the size of those in the normal group in just 17 days.[13] The high-calorie-diet animals had high levels of insulin and other growth-promoting molecules, demonstrating a close connection between insulin and cancer growth rate.

Human Studies Show Dangers of Elevated Insulin

Coming atop the most recent laboratory studies are a number of human studies that emphasize the essential role of insulin in promoting cancers, making this an area of fertile interest among oncologists and prevention experts.



Huge Reductions in Insulin Levels with Popular Dietary Supplements

Resveratrol	47% reduction[29]
Omega-3	34% reduction[30]
Green tea	22% reduction[62]
Ginseng	13% reduction[63]

Insulin levels have been implicated in at least seven of the most common human malignancies.

Colorectal cancer remains the second cause of cancer death in the US among men and women combined.[14] Elevated insulin levels are a risk factor for these lower bowel tumors.[15,16] Ethnic groups with low insulin ***sensitivity***, even absent obesity, are known to have higher rates of colorectal cancers.[16]

A study involving patients who underwent both routine colonoscopy exams and fasting insulin measurements found that insulin levels raise the risk of having precancerous growths called adenomas by **17%** to **42%**, with higher risk associated with higher levels.[17]

Gastric (stomach) cancer risk is **69%** higher for people with blood insulin levels in the middle third, compared with those in the bottom third of results, and **101%** higher in those with the top one-third of insulin levels.[18]

Cancers of the female reproductive system seem especially sensitive to elevated insulin levels. For example, women with higher insulin levels are at a **2-** to **3-fold** increased risk for breast cancer, compared to those with lower levels.[19] Similarly, risk for endometrial (uterine lining) cancer rises dramatically with elevated insulin.[20] Risk increases with higher insulin levels almost **10-fold** for early premalignant changes in endometrial cells, **8.5-fold** for later premalignant changes, **18-fold** for true precancerous lesions, and a shocking **45-fold** for type I endometrial cancer.[21] Elevated serum insulin levels are also associated with increased risk for ovarian cancer.[22]

Prostate cancer risk is also closely associated with insulin levels. Men with the highest blood insulin levels in one study showed a **2.55-fold** increased risk of malignancy compared with those having the lowest levels.[5] And men with the highest level of insulin had a **5.62-fold** increase in the risk of having locally advanced tumors than those with lower levels, while the most insulin-resistant subjects' risk of advanced cancer was more than **3-fold** increased.[23]

Liver cancer has multiple triggers, including infection with hepatitis viruses. Among people infected with hepatitis B virus, those with the highest insulin levels have an approximate **2.4-fold** increase in the risk of developing liver cancer.[24]

Supplements May Reduce Blood Insulin Levels

Several nutrients have emerged showing promise in reducing insulin levels and/or increasing insulin sensitivity, which lowers glucose and insulin blood levels.

The most prominent of these are ***resveratrol***,[25-29] ***fish oil*** rich in the omega-3 fats eicosapentaenoic and docosahexaenoic acids (EPA and DHA),[30-33] ***green tea extracts***,[34-36] and ***ginseng*** extract.[37]

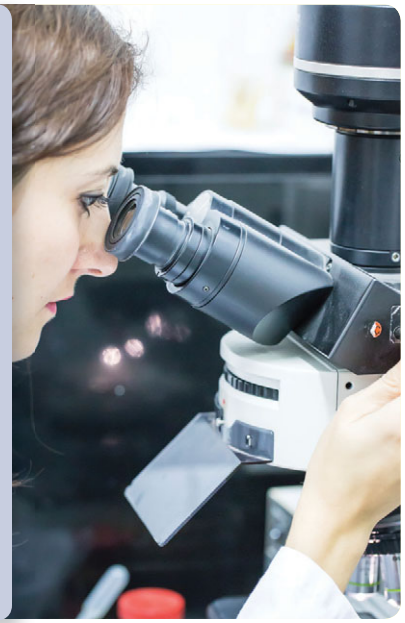
Metformin, a prescription antidiabetic drug, is also strongly associated with reduced cancer risk, and lowers insulin levels as a direct part of its actions.[2,13,38,39]

Summary

Consuming a Western diet high in sugars and carbohydrates produces up to a **41%** increase in the risk of developing the most common kind of breast cancer. Stomach, prostate, liver, and reproductive cancers are also at an increased risk. Natural supplements may help reduce blood insulin levels, especially fish oil, green tea extracts, and resveratrol. Metformin, of course, is also strongly associated with lowering insulin levels, thereby reducing these cancer risks. ●

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

Additional Ways to Help Control Insulin Levels	
Nutrient	**Impact**
L-arabinose[40-42]	Lowers insulin levels; reduces insulin resistance
Chromium[43-47]	Enhances insulin sensitivity; lowers insulin levels
Coffee[48-51]	Improves insulin resistance; IGF-1 levels are lower in women coffee drinkers
Phaseolus vulgaris (white kidney bean) and other legume extracts[52-55]	Lowers insulin levels
Phloridzin[56-58]	Normalizes glucose tolerance and insulin sensitivity
Sorghum[59-61]	Improves insulin sensitivity; lowers insulin levels



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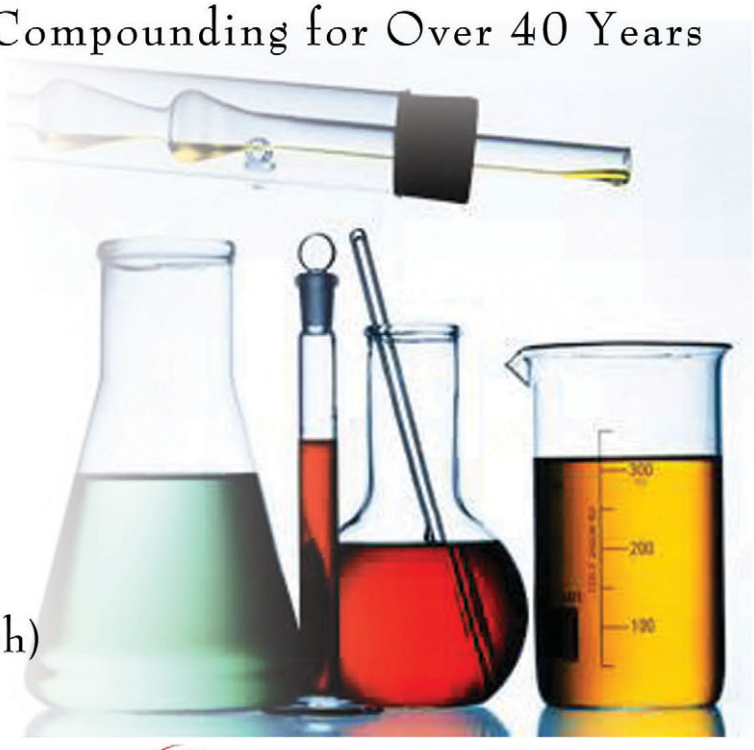

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MEN'S ANNUAL BLOOD TESTING	RETAIL PRICE	SUPER SALE PRICE
○ **MALE LIFE EXTENSION PANEL (LC322582)** CBC/Chemistry Profile (description on next page) DHEA-S PSA (prostate-specific antigen) Homocysteine C-Reactive Protein (high-sensitivity) Free Testosterone Total Testosterone Estradiol TSH for thyroid function Vitamin D (25-hydroxyvitamin D) Hemoglobin A1c	$400	$199
○ **MALE HORMONE ADD-ON PANEL* (LCADDM)** **Pregnenolone and Dihydrotestosterone (DHT)** To provide an even more in-depth analysis of a man's hormone status, Life Extension has created this panel as an addition to the Male Life Extension Panel. This panel provides information about a testosterone metabolite that can affect the prostate; and the hormone pregnenolone that acts as a precursor to all other steroid hormones.	$160	$90
○ **THYROID ADD-ON PANEL (LCTHYROID)** **Free T3 & Free T4**.	$73.33	$36
○ **OMEGA CHECK™** (LCOMEGA)** Provides valuable information on your risk of developing heart disease, sudden heart attack, and cardiac death. The Omega Check™ also includes your AA:EPA ratio, allowing you to determine and track a major factor in total body inflammation.	$175	$99
○ **INSULIN (LC004333)** Helpful to assess insulin resistance.	$39.87	$24.42
○ **NMR LIPOPROFILE® (LC123810)** The NMR Lipoprofile® directly measures LDL particle size and number as well as HDL particle number, total cholesterol, and triglycerides. It also provides a calculation of one's risk of insulin resistance by assessing abnormalities in lipoprotein markers.	$132	$74.25
○ **ADVANCED OXIDIZED LDL PANEL*(LC100035)** This panel looks at vascular inflammatory biomarkers, beginning with lifestyle choices to the development of metabolic and cardiovascular disease as well as the formation of vulnerable plaque. The panel contains the following tests: F2-Isoprostanes, Myeloperoxidase and Oxidized LDL.	$380	$213.75
○ **FOOD SAFE ALLERGY TEST** (LCM73001)** This test measures delayed (IgG) food allergies for 95 common foods.	$264	$148.50

WOMEN'S ANNUAL BLOOD TESTING	RETAIL PRICE	SUPER SALE PRICE
○ **FEMALE LIFE EXTENSION PANEL (LC322535)** CBC/Chemistry Profile (description on next page) DHEA-S Estradiol Homocysteine C-Reactive Protein (high-sensitivity) Progesterone Free Testosterone Total Testosterone TSH for thyroid function Vitamin D (25-hydroxyvitamin D) Hemoglobin A1c	$400	$199
○ **FEMALE HORMONE ADD-ON PANEL* (LCADDF)** **Pregnenolone and Total Estrogen** To provide an even more in-depth analysis of a woman's hormone status, Life Extension has created this panel as an addition to the Female Life Extension Panel. This panel provides information about total estrogen status; and the hormone pregnenolone that acts as a precursor to all other steroid hormones.	$166.75	$93.75
○ **THYROID ADD-ON PANEL (LCTHYROID)** **Free T3 & Free T4**.	$73.33	$36
○ **OMEGA CHECK™** (LCOMEGA)** Provides valuable information on your risk of developing heart disease, sudden heart attack, and cardiac death. The Omega Check™ also includes your AA:EPA ratio, allowing you to determine and track a major factor in total body inflammation.	$175	$99
○ **INSULIN (LC004333)** Helpful to assess insulin resistance.	$39.87	$24.42
○ **NMR LIPOPROFILE® (LC123810)** The NMR Lipoprofile® directly measures LDL particle size and number as well as HDL particle number, total cholesterol, and triglycerides. It also provides a calculation of one's risk of insulin resistance by assessing abnormalities in lipoprotein markers.	$132	$74.25
○ **ADVANCED OXIDIZED LDL PANEL* (LC100035)** This panel looks at vascular inflammatory biomarkers, beginning with lifestyle choices to the development of metabolic and cardiovascular disease as well as the formation of vulnerable plaque. The panel contains the following tests: F2-Isoprostanes, Myeloperoxidase and Oxidized LDL.	$380	$213.75
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○ **ADRENAL STRESS PROFILE-SALIVA** (LC100046)** Cortisol X4, DHEA-S, Cortisol AM/DHEA-S ratio, Secretory IgA.	$233.33	$131.25
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◯ **CBC/CHEMISTRY PROFILE (LC381822)** **Note: This CBC/Chemistry Profile is included in many Life Extension Panels. Please note panel descriptions.**	$47	$26

CARDIOVASCULAR RISK PROFILE

Total Cholesterol	Cholesterol/HDL Ratio
HDL Cholesterol	Estimated CHD Risk
LDL Cholesterol	Glucose
Triglycerides	

LIVER FUNCTION PANEL

AST (SGOT)	Total Bilirubin
ALT (SGPT)	Alkaline phosphatase
LDH	

KIDNEY FUNCTION PANEL

BUN	BUN/Creatinine Ratio
Creatinine	Uric Acid

BLOOD PROTEIN LEVELS

Total Protein	Globulin
Albumin	Albumin/Globulin Ratio

BLOOD COUNT/RED AND WHITE BLOOD CELL PROFILE

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

BLOOD MINERAL PANEL

Calcium	Sodium
Potassium	Chloride
Phosphorus	Iron

◯ **MALE ELITE PANEL (LC100016)*** $766.66 $431.25
Chem/CBC profile, Free and total Testosterone, Total Estrogens, Estradiol, DHEA-S, Progesterone, Pregnenolone, DHT, FSH, LH, TSH, Free T3, Free T4, Reverse T3, Free and Total PSA, IGF-1, SHBG, Vitamin D 25-OH, hs-CRP, ferritin, homocysteine.

◯ **FEMALE ELITE PANEL (LC100017)*** $766.66 $431.25
Chem/CBC profile, Free and total Testosterone, Total Estrogens, Estradiol, Estrone, DHEA-S, Progesterone, Pregnenolone, DHT, FSH, LH, TSH, Free T3, Free T4, Reverse T3, IGF-1, SHBG, Vitamin D 25-OH, hs-CRP, ferritin, homocysteine.

◯ **WEIGHT LOSS PANEL-BASIC (LC100027)** $173.33 $97.50
CBC/Chemistry profile (see description above), DHEA-S, free and total Testosterone, Estradiol, Progesterone, Cortisol, TSH, Free T3, Insulin and Hemoglobin A1c.

◯ **WEIGHT LOSS PANEL-COMPREHENSIVE (LC100028)** $366.66 $206.25
CBC/Chemistry profile (see description above), DHEA-S, free and total Testosterone, Estradiol, Progesterone, Cortisol, TSH, Free T3, Free T4, Reverse T3, Insulin, Hemoglobin A1c, Vitamin D 25-hydroxy, C-reactive protein (high sensitivity), and Ferritin.

◯ **HEALTHY AGING PANEL-BASIC* (LC100025)** $198.66 $111.75
CBC/Chemistry profile (see description above), C-reactive protein (high sensitivity), Vitamin B12, Folate, Vitamin D 25-hydroxy, Hemoglobin A1c, TSH, Ferritin, and Insulin.

◯ **HEALTHY AGING PANEL-COMPREHENSIVE* (LC100026)** $332 $186.75
CBC/Chemistry profile (see description above), C-reactive protein (high sensitivity), Vitamin B12, Folate, Homocysteine, Vitamin D 25-hydroxy, Hemoglobin A1c, TSH, Free T3, Free T4, Ferritin, Urinalysis, Fibrinogen, and Insulin.

	RETAIL PRICE	SUPER SALE PRICE
◯ **FEMALE COMPREHENSIVE HORMONE PANEL* (LC100011)** CBC/Chemistry Profile (see description at left), DHEA-S, Estradiol, Total Estrogens, Progesterone, Pregnenolone, Total and Free Testosterone, SHBG, TSH, Free T3. This panel now includes Free T4 and Cortisol with no increase in price!	$398.66	$224.25
◯ **MALE COMPREHENSIVE HORMONE PANEL* (LC100010)** CBC/Chemistry Profile (see description at left), DHEA-S, Estradiol, DHT, PSA, Pregnenolone, Total and Free Testosterone, SHBG, TSH, Free T3. This panel now includes Free T4 and Cortisol with no increase in price!	$398.66	$224.25
◯ **MALE BASIC HORMONE PANEL (LC100012)** DHEA-S, Estradiol, Total and Free Testosterone, PSA.	$100	$56.25
◯ **FEMALE BASIC HORMONE PANEL (LC100013)** DHEA-S, Estradiol, Total and Free Testosterone, Progesterone.	$100	$56.25
◯ **ANEMIA PANEL* (LC100006)** CBC/Chemistry Profile (see description), Ferritin, Total Iron Binding Capacity (TIBC), Vitamin B12, Folate.	$105.33	$59.25
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◯ **DIABETES MANAGEMENT PROFILE – BASIC (LC100039)** Hemoglobin A1C, Glucose, Insulin.	$52	$29.25
◯ **AUTOIMMUNE DISEASE SCREEN (L100041C)** ANA screen, hs-CRP, TNFα, Immunoglobulins, IgA, IgG and IgM.	$265.33	$149.25
◯ **COMPREHENSIVE THYROID PANEL (LC100018)** TSH, T4, Free T4, Free T3, Reverse T3, TPO, ATA	$265.33	$149.25
◯ **LIFE EXTENSION THYROID PANEL (LC304131)** TSH, T4, Free T3, Free T4.	$100	$56.25
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Lecithin Granules
Migra-Eeze™
Neuro-Mag® Magnesium L-Threonate
Neuro-Mag® Magnesium L-Threonate with Calcium and Vitamin D3
Optimized Ashwagandha Extract
Prevagen™
PS (Phosphatidylserine) Caps
Vinpocetine

Cholesterol Management

Advanced Lipid Control
Cho-Less™
CHOL-Support™
Policosanol
Red Yeast Rice
Theaflavins Standardized Extract
Vitamin B3 Niacin Capsules

Digestion Support

Artichoke Leaf Extract
Carnosoothe with PicroProtect™
Digest RC®
Effervescent Vitamin C - Magnesium Crystals
Enhanced Super Digestive Enzymes
Enhanced Super Digestive Enzymes w/Probiotics
Esophageal Guardian
Extraordinary Enzymes
Fem Dophilus
FiberImmune Support
Ginger Force®
Organic Golden Flax Seed
Pancreatin
Regimint
Tranquil Tract™
TruFiber™
WellBetX PGX plus Mulberry

Energy Management

Adrenal Energy Formula
Asian Energy Boost
D-Ribose Powder
D-Ribose Tablets
Forskolin
Mitochondrial Basics with BioPQQ®
Mitochondrial Energy Optimizer with BioPQQ®
NAD+ Cell Regenerator™
Peak ATP® with GlycoCarn®
PQQ Caps with BioPQQ®
Rhodiola Extract
RiboGen™ French Oak Wood Extract
Triple Action Thyroid

Eye Health

Astaxanthin with Phospholipids
Brite Eyes III
Certified European Bilberry Extract
Eye Pressure Support with Mirtogenol®
MacuGuard® Ocular Support
MacuGuard® Ocular Support with Astaxanthin
Tear Support with MaquiBright®

Fish Oil & Omegas

OMEGA FOUNDATIONS® Mega EPA/DHA
OMEGA FOUNDATIONS® Mega GLA with Sesame Lignans
OMEGA FOUNDATIONS® Super Omega-3 EPA/DHA with Sesame Lignans & Olive Extract
OMEGA FOUNDATIONS® Super Omega-3 Plus EPA/DHA with Sesame Lignans, Olive Extract, Krill & Astaxanthin
Organic Golden Flax Seed
Provinal® Purified Omega-7
Vegetarian Sourced DHA

Food

Rich Rewards® Breakfast Blend
Rich Rewards® Breakfast Blend Natural Mocha Flavor
Rich Rewards® Breakfast Blend Natural Vanilla Flavor
Rich Rewards® Breakfast Blend Whole Bean Coffee
Rich Rewards® Decaf Roast
Stevia Sweetener

Glucose Management

CinSulin® with InSea$^{2®}$ and Crominex® 3+
Mega Benfotiamine
Natural Glucose Absorption Control
Tri Sugar Shield®

Heart Health

Aspirin (Enteric Coated)
Bio Active Folate & Vitamin B12 Caps
Cardio Peak™ with Standardized Hawthorn and Arjuna
Fibrinogen Resist™ with Nattokinase
Optimized Carnitine with GlycoCarn®
Super Ubiquinol CoQ10
Super Ubiquinol CoQ10 with BioPQQ®
Super Ubiquinol CoQ10 with Enhanced Mitochondrial Support™
Super-Absorbable CoQ10 Ubiquinone with *d*-Limonene
TMG Powder
TMG Liquid Capsules

Hormone Balance

DHEA (Dehydroepiandrosterone)
Inner Power
Pregnenolone
Triple Action Cruciferous Vegetable Extract with Resveratrol
Triple Action Cruciferous Vegetable Extract

Immune Support

AHCC®
Echinacea Extract
Enhanced Zinc Lozenges
i26 Hyperimmune Egg
Immune Modulator with Tinofend®
Immune Protect with PARACTIN®
Immune Senescence Protection Formula™
Kinoko® Gold AHCC
Kyolic® Garlic Formula 102
Kyolic® Garlic Formula 105
Kyolic® Reserve
Lactoferrin (apolactoferrin) Caps
NK Cell Activator™
Optimized Garlic
Optimized Quercetin
Peony Immune
ProBoost Thymic Protein A
Reishi Extract Mushroom Complex
Standardized Cistanche
Ten Mushroom Formula®
Zinc Lozenges

Inflammation Management

5-LOX Inhibitor with AprèsFlex®
Advanced Bio-Curcumin® with Ginger & Turmerones
Black Cumin Seed Oil with Bio-Curcumin®
Black Cumin Seed Oil
Boswella
Cytokine Suppress™ with EGCG
Nervia®
Serraflazyme
Specially-Coated Bromelain
Super Bio-Curcumin®
Zyflamend® Whole Body

Joint Support

Arthro-Immune Joint Support
ArthroMax® Advanced with UC-II® & AprèsFlex®
ArthroMax® with Theaflavins & AprèsFlex®
Bio-Collagen with Patented UC-II®
Fast-Acting Joint Formula
Glucosamine/Chondroitin Capsules
Krill Healthy Joint Formula
MSM (Methylsulfonylmethane)

Kidney & Bladder Support

Cran-Max® Cranberry Whole Fruit Concentrate
Optimized Cran-Max® with Ellirose™
Uric Acid Control
Water-Soluble Pumpkin Seed Extract

Liver Health & Detoxification

Anti-Alcohol Antioxidants with HepatoProtection Complex
Calcium D-Glucarate
Chlorella
Chlorophyllin
European Milk Thistle
Glutathione, Cysteine & C
HepatoPro
Liver Efficiency Formula
N-Acetyl-L-Cysteine
PectaSol-C®
Silymarin
SODzyme® with GliSODin® & Wolfberry

Longevity & Wellness

AMPK Activator
AppleWise Polyphenol Extract
Berry Complete
Blueberry Extract
Blueberry Extract with Pomegranate

CR Mimetic Longevity Formula
DNA Protection Formula
Enhanced Berry Complete with Acai
Essential Daily Nutrients
Grapeseed Extract with Resveratrol & Pterostilbene
Mega Green Tea Extract (decaffeinated)
Mega Green Tea Extract (lightly caffeinated)
Optimized Fucoidan with Maritech® 926
Optimized Resveratrol
Optimized Resveratrol with Nicotinomide Riboside
pTeroPure®
Pycnogenol® French Maritime Pine Bark Extract
Resveratrol with Pterostilbene
RNA (Ribonucleic Acid)
Super Alpha-Lipoic Acid
Super R-Lipoic Acid
X-R Shield

Men's Health

Mega Lycopene Extract
PalmettoGuard® Saw Palmetto with Beta-Sitosterol
PalmettoGuard® Saw Palmetto/Nettle Root Formula with Beta-Sitosterol
Pomi-T®
Prelox® Natural Sex for Men®
Super MiraForte with Standardized Lignans
Triple Strength ProstaPollen™
Ultra Natural Prostate

Minerals

Boron
Chromium Ultra
Iron Protein Plus
Magnesium (Citrate)
Magnesium Caps
Only Trace Minerals
Optimized Chromium with Crominex® 3+
Sea-Iodine™
Se-Methyl L-Selenocysteine
Super Selenium Complex
Vanadyl Sulfate
Zinc Caps

Miscellaneous

Solarshield® Sunglasses

Mood & Stress Management

5 HTP
L-Theanine
Natural Stress Relief
SAMe (S-Adenosyl-Methionine)

Multivitamins

Children's Formula Life Extension Mix™
Comprehensive Nutrient Packs ADVANCED
Life Extension Mix™ Capsules without Copper
Life Extension Mix™ Capsules
Life Extension Mix™ Powder without Copper
Life Extension Mix™ Powder
Life Extension Mix™ Tablets with Extra Niacin
Life Extension Mix™ Tablets without Copper
Life Extension Mix™ Tablets
Once-Daily Health Booster
One-Per-Day Tablets
Two-Per-Day Capsules
Two-Per-Day Tablets

Personal Care

Anti-Aging Rejuvenating Scalp Serum
Biosil
Dr. Proctor's Advanced Hair Formula
Dr. Proctor's Shampoo
European Leg Solution Featuring Certified Diosmin 95
Face Master Platinum Facial Toning System
Hair, Skin & Nail Rejuvenation Formula w/VERISOL®
Hair Suppress Formula
Life Extension Toothpaste
Sinus Cleanser
Venotone
Xyliwhite Mouthwash

Pet Care

Cat Mix
Dog Mix

Probiotics

Bifido GI Balance
BroccoMax®
FLORASSIST® Heart Health Probiotic
FLORASSIST® Oral Hygiene
FLORASSIST® Balance
FLORASSIST® Mood
FLORASSIST® Throat Health
Theralac® Probiotics
TruFlora® Probiotics

Skin Care

Advanced Anti-Glycation Peptide Serum
Advanced Lightening Cream
Advanced Peptide Hand Therapy
Advanced Triple Peptide Serum
Advanced Under Eye Serum with Stem Cells
Amber Self MicroDermAbrasion
Anti-Aging Face Oil
Anti-Aging Mask
Anti-Aging Rejuvenating Face Cream
Anti-Glycation Serum with Blueberry & Pomegranate Extracts
Antioxidant Facial Mist
Anti-Oxidant Rejuvenating Foot Cream
Anti-Oxidant Rejuvenating Foot Scrub
Anti-Oxidant Rejuvenating Hand Cream
Anti-Redness & Adult Blemish Lotion
Bioflavonoid Cream
Broccoli Sprout Cream
Collagen Boosting Peptide Serum
Corrective Clearing Mask
DNA Repair Cream
Dual-Action MicroDermAbrasion
Essential Plant Lipids Reparative Serum
Face Rejuvenating Anti-Oxidant Cream
Fine Line-Less
Healing Formula
Healing Mask
Healing Vitamin K Cream
Hyaluronic Facial Moisturizer
Hyaluronic Oil-Free Facial Moisturizer
Hydrating Anti-Oxidant Facial Mist
Hydroderm
Lifting & Tightening Complex
Lycopene Cream
Melatonin Cream
Mild Facial Cleanser
Multi Stem Cell Skin Tightening Complex
Neck Rejuvenating Anti-Oxidant Cream
Pigment Correcting Cream
Rejuvenating Serum
Rejuvenex® Body Lotion
RejuveneX® Factor Firming Serum
Renewing Eye Cream
Resveratrol Anti-Oxidant Serum
Shade Factor
Skin Lightening Serum
Skin Restoring Phytoceramides with Lipowheat®
Skin Stem Cell Serum
Stem Cell Cream with Alpine Rose
Tightening & Firming Neck Cream
Triple Vitamin C Cream
Ultra Eyelash Booster
Ultra Lip Plumper
Ultra Rejuvenex®
Ultra RejuveNight®
Ultra Wrinkle Relaxer
Under Eye Refining Serum
Under Eye Rescue Cream
Vitamin C Serum
Vitamin D Lotion
Vitamin E-ssential Cream
Youth Serum

Sleep

Bioactive Milk Peptides
Enhanced Natural Sleep® with Melatonin
Enhanced Natural Sleep® without Melatonin
Fast-Acting Liquid Melatonin
Glycine
L-Tryptophan
Melatonin
Optimized Tryptophan Plus

Sports Performance

Creatine Capsules
Creatine Whey Glutamine Powder (Vanilla Flavor)
New Zealand Whey Protein Concentrate (Natural Chocolate and Vanilla Flavor)
Tart Cherry Extract
Whey Protein Isolate (Chocolate and Vanilla Flavor)

Vitamins

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

Weight Management

7-Keto® DHEA Metabolite
Advanced Anti-Adipocyte Formula
Advanced Natural Appetite Suppress
CalReduce Selective Fat Binder
DHEA Complete
Garcinia HCA
HCActive™ Garnicia Cambogia Extract
Integra-Lean®
Mediterranean Trim with Sinetrol™-XPur
Optimized Irvingia with Phase 3™ Calorie Control Complex
Optimized Saffron with Satiereal®
Super Citrimax®
Super CLA Blend with Guarana and Sesame Lignans
Super CLA Blend with Sesame Lignans
Waist-Line Control™

Women's Health

Advanced Natural Sex for Women® 50+
Breast Health Formula
Femmenessence MacaPause®
Natural Estrogen
ProgestaCare® for Women
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			
01525	**ACETYL-L-CARNITINE ARGINATE** • 100 veg. caps	59.00	44.25	38.24			
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			
01828	**ADVANCED LIPID CONTROL** • 60 veg. caps	30.00	22.50	20.25			
00681	**AHCC®** • 500 mg, 30 caps	59.98	44.99				
29727	**AHCC® (KINOKO® GOLD)** • 500 mg, 60 veg. caps	74.95	52.47				
00457	**ALPHA-LIPOIC ACID W/BIOTIN** (Super) • 250 mg, 60 caps	37.00	27.75	24.00			
01907	**AMPK ACTIVATOR** • 90 veg. caps	48.00	36.00	33.00			
01440	**ANTI-ALCOHOL ANTIOXIDANTS W/HEPATOPRO** • 100 caps	26.00	19.50	17.25			
01509	**ANTI-ADIPOCYTE FORMULA W/MERATRIM® & INTEGRA LEAN®** (Advanced) • 60 veg. caps	39.00	29.25	27.00			
01625	**APPLEWISE POLYPHENOL EXTRACT** 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	48.00	36.00	33.00			
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			
01404	**ARTHRO-IMMUNE JOINT SUPPORT** • 60 veg. caps	32.00	24.00	21.00			
00919	**ARTICHOKE LEAF EXTRACT** • 500 mg, 180 veg. caps	30.00	22.50	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						
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 W/ACAI** (Enhanced) • 60 veg. caps	29.00	21.75	19.50			
00664	**BETA-CAROTENE** • 25,000 IU, 100 softgels	11.25	8.44				
01622	**BIFIDO GI BALANCE** • 60 veg. caps	20.00	15.00	13.50			
01073	**BILBERRY EXTRACT** • 100 mg, 100 veg. caps	42.00	31.50	28.50			
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	18.95	15.16				
*01007	**BIOSIL™** • 1 fl oz	31.99	25.59				
00102	**BIOTIN** • 600 mcg, 100 caps	7.50	5.63	4.88			
01709	**BLACK CUMIN SEED OIL** • 60 softgels	16.00	12.00	10.50			
01710	**BLACK CUMIN SEED OIL W/BIO-CURCUMIN®** • 60 softgels	32.00	24.00	22.50			
01008	**BLAST™** • 600 grams of powder	26.95	20.21				
70000	**BLOOD PRESSURE MONITOR (ACCUFIT™)** • med/lg cuff	79.99	49.99				
70004	**BLOOD PRESSURE MONITOR** • Digital wrist cuff	69.95	52.46				

SUBTOTAL OF COLUMN 1

ITEM No.	PRODUCT	Retail Each $	YOUR PRICE 1 Unit Each	4 Unit Each	10 Unit Each	QTY	Total
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			
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			
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			
26576	**BROCCO MAX®** • 60 veg. caps	26.95	20.21				
01203	**BROMELAIN** (Specially-coated) 500 mg, 60 enteric coated tablets	21.00	15.75	14.25			
	C						
01653	**CALCIUM CITRATE W/VITAMIN D** • 300 caps	24.00	18.00	15.94			
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			
00916	**CARNITINE W/GLYCOCARN®** (Optimized) • 60 veg. caps	36.00	27.00	24.00			
01532	**L-CARNITINE** • 500 mg, 30 veg. caps	15.00	11.25	9.90			
01258	**CARNOSOOTHE W/PICROPROTECT™** • 60 veg. caps	29.95	22.46	20.25			
01829	**CARNOSINE** • 500 mg, 60 veg. caps	36.00	27.00	24.00			
01687	**CARNOSINE** (Super) • 500 mg, 90 veg. caps	66.00	49.50	45.00			
01932	**CAT MIX** • 100 grams powder	14.00	10.50	8.25			
01899	**CHILDREN'S FORMULA LIFE EXTENSION MIX™** 100 chewable tablets	20.00	15.00	13.50			
00550	**CHLORELLA** • 500 mg, 200 tablets	23.50	17.63				
01571	**CHLOROPHYLLIN** • 100 mg, 100 veg. caps	24.00	18.00	15.00			
01359	**CHO-LESS™** • 90 capsules	35.00	26.25				
01910	**CHOL-SUPPORT™** • 60 liquid veg. caps	48.00	36.00	32.00			
01477	**CHROMIUM ULTRA** • 100 veg. caps	24.00	18.00	15.75			
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			
01818	**CITRIMAX®** (Super) • 180 veg. caps	40.00	30.00	28.50			
00818	**CLA BLEND W/SESAME LIGNANS** (Super) 1,000 mg, 120 softgels	36.00	27.00	24.75	19.75		
00819	**CLA BLEND W/GUARANA & SESAME** (Super) 1,000 mg, 120 softgels	42.00	31.50	28.75			
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		

SUBTOTAL OF COLUMN 2

RECEIVE 25% OFF THE RETAIL PRICE OF ALL PRODUCTS

ITEM No.	PRODUCT	Retail Each $	YOUR PRICE 1 Unit Each	4 Unit Each	10 Unit Each	QTY	Total
01659	**COGNIZIN® CDP CHOLINE CAPS** • 250 mg, 60 veg. caps	36.00	27.00	25.50			
01945	**COMPLETE B-COMPLEX** (BioActive) • 60 veg. caps	12.00	9.00	8.00			
02098	**COMPREHENSIVE NUTRIENT PACKS ADVANCED** • 30 packs	90.00	67.50	61.50			
00949	**COQ10 w/*d*-LIMONENE** (Super-Absorbable) 50 mg, 60 softgels	25.00	18.75	16.50	15.00		
00950	**COQ10 w/*d*-LIMONENE** (Super-Absorbable) 100 mg, 100 softgels	46.00	34.50	28.00	26.25		
01929	**COQ10** (Super ubiquinol) • 100 mg, 60 softgels	56.00	42.00	36.00	33.00		
01733	**COQ10 w/BIOPQQ®** (Super ubiquinol) • 100 mg, 30 softgels	54.00	40.50	33.00	30.00		
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			
01746	**CREATINE WHEY GLUTAMINE POWDER** • 454 grams (vanilla)	30.00	22.50	20.25			
01429	**CR MIMETIC LONGEVITY FORMULA** • 60 veg. caps	39.00	29.25	27.00			
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						
80157	**ADVANCED ANTI-GLYCATION PEPTIDE SERUM** • 1 oz	53.00	39.75	34.50			
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 oz	65.00	48.75	42.75			
80140	**ADVANCED UNDER EYE SERUM W/STEM CELLS** • .33 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 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 oz	46.00	34.50	29.25			
80134	**ANTI-GLYCATION SERUM W/BLUEBERRY & POMEGRANATE EXTRACTS** • 1 oz	33.00	24.75	23.51			
80133	**ANTIOXIDANT FACIAL MIST** • 2 oz	32.00	24.00	22.80			
80127	**ANTIOXIDANT REJUVENATING FOOT CREAM** • 2 oz	45.00	33.75	32.10			
80128	**ANTIOXIDANT REJUVENATING FOOT SCRUB** • 2 oz	59.00	44.25	38.94			
80117	**ANTIOXIDANT REJUVENATING HAND CREAM** • 2 oz	64.00	48.00	43.12			
80105	**ANTI-REDNESS & ADULT BLEMISH LOTION** • 1 oz	74.50	55.88	49.17			
80147	**BIOFLAVONOID CREAM** • 1 oz	46.00	34.50	29.25			
80144	**BROCCOLI SPROUT CREAM** • 1 oz	46.00	34.50	29.25			
80156	**COLLAGEN BOOSTING PEPTIDE SERUM** • 1 oz	59.00	44.25	39.00			
80120	**CORRECTIVE CLEARING MASK** • 2 oz	64.50	48.38	42.57			
80141	**DNA REPAIR CREAM** • 1 oz	49.00	36.75	31.50			

SUBTOTAL OF COLUMN 3

ITEM No.	PRODUCT	Retail Each $	YOUR PRICE 1 Unit Each	4 Unit Each	10 Unit Each	QTY	Total
80108	**ESSENTIAL PLANT LIPIDS REPARATIVE SERUM** • 1 oz	74.95	56.21	49.46			
80123	**FACE REJUVENATING ANTIOXIDANT CREAM** • 2 oz	69.50	52.13	45.87			
80107	**FINE LINE-LESS** • 1 oz	74.50	55.88	49.17			
80131	**HAIR SUPPRESS FORMULA** • 4 oz	59.00	44.25	38.94			
80137	**HEALING FORMULA ALL-IN-ONE CREAM** • 1 oz	53.00	39.75	34.07			
80115	**HEALING MASK** • 2 oz	64.50	48.38	42.57			
80102	**HEALING VITAMIN K CREAM** • 1 oz	79.50	59.63	52.47			
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 ANTIOXIDANT FACE MIST** • 4 oz	39.95	29.96	28.50			
80103	**LIFTING & TIGHTENING COMPLEX** • 1 oz	74.50	55.88	49.17			
80146	**LYCOPENE CREAM** • 1 oz	28.00	21.00	19.05			
80135	**MELATONIN CREAM** • 1 oz	33.00	24.75	20.33			
80114	**MILD FACIAL CLEANSER** • 8 oz	59.00	44.25	38.94			
80159	**MULTI STEM CELL SKIN TIGHTENING COMPLEX** • 1 oz	59.00	44.25	39.00			
80122	**NECK REJUVENATING ANTIOXIDANT CREAM** • 2 oz	64.00	48.00	42.24			
80111	**PIGMENT CORRECTING CREAM** • 1/2 oz	74.00	55.50	48.84			
80106	**REJUVENATING SERUM** • 1 oz	74.50	55.88	49.17			
80150	**RENEWING EYE CREAM** • 1/2 oz	65.00	48.75	42.75			
80142	**RESVERATROL ANTI-OXIDANT SERUM** • 1 oz	46.00	34.50	29.25			
80112	**SKIN LIGHTENING SERUM** • 1/2 oz	85.00	63.75	56.10			
80130	**SKIN STEM CELL SERUM** • 1 oz	74.00	55.50	51.75			
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	**TIPLE VITAMIN C CREAM** • 1 oz jar	59.00	44.25	39.00			
80160	**ULTRA EYELASH BOOSTER** • 0.25 oz (2 units $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 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 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			
80149	**YOUTH SERUM** • 1 oz	65.00	48.75	42.75			
	D						
01912	**DAILY C+ CITRUS FLAVOR** • 30 stick packs	21.00	15.75	14.25			
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 sourced) • 30 veg. softgels	20.00	15.00	13.50			
00607	**DHEA** • 25 mg, 100 tablets (Dissolve in mouth)	14.00	10.50	8.81			
01478	**DHEA COMPLETE** • 60 veg. caps	48.00	36.00	32.40			
00335	**DHEA** • 25 mg, 100 caps	16.00	12.00	11.00			
00454	**DHEA** • 15 mg, 100 caps	14.00	10.50	9.00			
00882	**DHEA** • 50 mg, 60 caps	19.00	14.25	12.75			
01689	**DHEA** • 100 mg, 60 veg. caps	24.00	18.00	16.50			

SUBTOTAL OF COLUMN 4

ITEM No.	PRODUCT	Retail Each $	YOUR PRICE 1 Unit Each	4 Unit Each	10 Unit Each	QTY	Total
01358	**DIGEST RC®** • 30 tablets	19.95	14.96	12.75			
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			
01570	**DNA PROTECTION FORMULA** • 60 veg. caps	34.00	25.50	24.00			
01931	**DOG MIX** • 100 grams powder	18.00	13.50	11.25			
02006	**DOPA-MIND™** • 60 veg. tabs	48.00	36.00	32.00			
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			
00899	**DUAL-ACTION MICRODERMABRASION ADV. EXFOLIATE** • 2.4 oz	39.95	29.96	29.21			
	E						
01528	**ECHINACEA EXTRACT** • 250 mg, 60 veg. caps	14.35	10.76	9.38			
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			
01937	**EPA/DHA** (Mega) • 120 softgels	20.00	15.00	13.50			
01737	**ESOPHAGEAL GUARDIAN** (Berry flavor) • 60 chewable tablets	36.00	27.00	24.00			
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			
01514	**EYE PRESSURE SUPPORT W/MIRTOGENOL®** • 30 veg. caps	38.00	28.50	25.50			
	F						
*01054	**FACE MASTER® PLATINUM** • Facial Toning System	199.00	199.00				
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			
20053	**FEM DOPHILUS®** • 30 caps	25.95	19.46				
20055	**FEM DOPHILUS®** • 60 caps	39.95	29.96				
01064	**FEMMENESSENCE MACAPAUSE®** • 120 veg. caps	34.99	26.24				
02007	**FIBERIMMUNE SUPPORT** (Apple Cinnamon) • 235 grams	34.00	25.50	23.50			
00718	**FIBRINOGEN RESIST™** • 30 veg. caps	49.00	36.75	33.00			
01749	**FLAX SEED** (Organic golden) • 14 oz	11.67	8.75				
01821	**FLORASSIST® HEART HEALTH PROBIOTIC** • 60 veg. caps	32.00	24.00	21.00			
02011	**FLORASSIST® ORAL HYGIENE** • 30 lozenges	20.00	15.00	13.50			
01825	**FLORASSIST® BALANCE** • 30 liquid veg. caps	32.00	24.00	21.00			
02000	**FLORASSIST® MOOD** • 60 caps	33.00	24.75	22.50			
01920	**FLORASSIST® THROAT HEALTH** • 30 lozenges	20.00	15.00	13.50			
01913	**FOLATE HIGH POTENCY** (Optimized) • 5,000 mcg, 30 veg. tablets	25.00	18.75	16.50			
01939	**FOLATE** (Optimized) • 1,000 mcg, 100 veg. tablets	19.00	14.25	12.75			
01842	**FOLATE + VITAMIN B12** (Bio Active) • 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						
00559	**GAMMA E TOCOPHEROL/TOCOTRIENOLS** • 60 softgels	42.00	31.50	27.75			
00759	**GAMMA E TOCOPHEROL W/SESAME LIGNANS** • 60 softgels	32.00	24.00	21.75			
01394	**GARLIC** (Optimized) • 200 veg. caps	24.95	18.71	15.75			
**01122	**GINGER FORCE®** • 60 liquid caps	34.95	26.21				

SUBTOTAL OF COLUMN 5

ITEM No.	PRODUCT	Retail Each $	YOUR PRICE 1 Unit Each	4 Unit Each	10 Unit Each	QTY	Total
01658	**GINKGO BILOBA CERTIFIED EXTRACT™** 120 mg, 365 veg. caps	46.00	34.50	31.50			
00756	**GLA WITH SESAME LIGNANS** (Mega) • 60 softgels	19.50	14.63	13.50			
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	20.00	15.00	13.50			
01669	**GLYCINE** • 1,000 mg, 100 veg. caps	12.00	9.00	8.10			
01411	**GRAPE SEED EXTRACT W/RESVERATROL & PTEROSTILBENE** 100 mg, 60 veg. caps	36.00	27.00	25.50			
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				
**02002	**HAIR, SKIN & NAIL REJUVENATION FORM W/VERISON®** 90 tabs	32.00	24.00	22.00			
01738	**HCA** (Garnicia) • 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			
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						
*01060	**I26 HYPERIMMUNE EGG** • 140 grams powder	54.99	46.75				
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			
01049	**INNERPOWER™** • 530 grams powder	42.00	31.50				
01674	**INOSITOL CAPSULES** • 1,000 mg, 360 veg. caps	62.00	46.50	43.50			
01292	**INTEGRA-LEAN® AFRICAN MANGO IRVINGIA** 150 mg, 60 veg. caps	28.00	21.00	18.00			
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						
00056	**JARRO-DOPHILUS EPS®** • 60 veg. caps	22.95	17.21				
01834	**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** • 60 softgels	33.95	25.46				
00316	**KYOLIC® GARLIC FORMULA 102** • 200 veg. caps	26.45	19.84				
00214	**KYOLIC® GARLIC FORMULA 105** • 200 caps	27.45	20.59				
00789	**KYOLIC® RESERVE** • 600 mg, 120 caps	27.95	20.96				
01681	**LACTOFERRIN** • 60 caps	52.00	39.00	36.00			
00020	**LECITHIN** • 16 oz granules	18.00	13.50	12.00			
02055	**LIFE EXTENSION MIX™** • 315 tablets	80.00	60.00	52.00	43.75		
02057	**LIFE EXTENSION MIX™ W/EXTRA NIACIN** • 315 tablets	80.00	60.00	52.00	43.75		
02054	**LIFE EXTENSION MIX™** • 490 caps	90.00	67.50	58.00	47.50		
02056	**LIFE EXTENSION MIX™ POWDER** • 14.81 oz	80.00	60.00	52.00	43.75		

SUBTOTAL OF COLUMN 6

ITEM No.	PRODUCT	Retail Each $	YOUR PRICE 1 Unit Each	4 Unit Each	10 Unit Each	QTY	Total
02065	**LIFE EXTENSION MIX™** • 315 tablets w/o copper	80.00	60.00	52.00	43.75		
02064	**LIFE EXTENSION MIX™** • 490 caps w/o copper	90.00	67.50	58.00	47.50		
02066	**LIFE EXTENSION MIX™ POWDER** • 14.81 oz w/o copper	80.00	60.00	52.00	43.75		
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						
01926	**MACUGUARD® OCULAR SUPPORT** • 60 softgels	22.00	16.50	14.85			
01927	**MACUGUARD® OCULAR SUPPORT w/ASTAXANTHIN** 60 softgels	42.00	31.50	28.50			
01459	**MAGNESIUM CAPS** • 500 mg, 100 veg. caps	12.00	9.00	7.50			
01682	**MAGNESIUM (CITRATE)** • 160 mg, 100 veg. caps	9.00	6.75	5.63			
01908	**MEDITERRANEAN TRIM WITH SINETROL™-XPUR** 60 veg. caps	18.00	13.50	12.00			
01668	**MELATONIN** • 300 mcg, 100 veg. caps	5.75	4.31	3.75			
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			
01734	**MELATONIN** (Fast-Acting Liquid) • 2 fl. oz (Citrus-Vanilla)	12.00	9.00	8.25			
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			
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	29.50	22.13	19.75			
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			
01698	**MIRAFORTE w/STANDARDIZED LIGNANS** (Super) • 120 caps	62.00	46.50	42.00			
01869	**MITOCHONDRIAL BASICS W/BIOPQQ®** • 30 caps	44.00	33.00	30.00			
01868	**MITOCHONDRIAL ENERGY OPTIMIZER w/BIOPQQ®** • 120 caps	72.00	54.00	48.00			
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			
	N						
01534	**N-ACETYL-L-CYSTEINE** • 600 mg, 60 veg. caps	14.00	10.50	10.13			
01904	**NAD+ CELL REGENERATOR™** • 100 mg, 30 veg. caps	34.00	25.50	19.50			
00066	**NATTOKINASE** • 60 softgels	25.50	19.13				
01807	**NATURAL APPETITE SUPPRESS** (Advanced) • 60 veg. caps	38.00	28.50	25.50			
00984	**NATURAL BP MANAGEMENT** • 60 tablets	44.00	33.00	30.00			
01892	**NATURAL ESTROGEN** • 60 veg. tabs	38.00	28.50	25.50			
01626	**NATURAL SEX FOR WOMEN® 50+** (Advanced) • 90 veg. caps	59.00	44.25	34.00			
01444	**NATURAL SLEEP®** • 60 veg. caps	13.00	9.75	7.50			
01551	**NATURAL SLEEP® w/ MELATONIN** (Enhanced) • 30 caps	22.00	16.50	15.00			
01511	**NATURAL SLEEP® W/O MELATONIN** (Enhanced) • 30 caps	20.00	15.00	13.50			

SUBTOTAL OF COLUMN 7

ITEM No.	PRODUCT	Retail Each $	YOUR PRICE 1 Unit Each	4 Unit Each	10 Unit Each	QTY	Total
01445	**NATURAL SLEEP® MELATONIN** • 5 mg, 60 veg. caps	18.00	13.50	12.00			
00987	**NATURAL STRESS RELIEF** • 30 veg. caps	28.00	21.00	18.00			
01121	**NERVIA®** • 60 softgels	49.95	37.46				
01603	**NEURO-MAG® MAGNESIUM L-THREONATE** • 90 veg. caps	40.00	30.00	27.00			
01602	**NEURO-MAG® MAGNESIUM L-THREONATE w/CALCIUM & VITAMIN D3** • 25 grams • Lemon flavor	40.00	30.00	27.00			
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		
01989	**ONCE-DAILY HEALTH BOOSTER** • 60 softgels	52.00	39.00	36.00			
02001	**ONE-PER-DAY** • 60 tablets	22.00	16.50	15.00			
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® SUPER SAW PALMETTO/ NETTLE ROOT W/BETA-SITOSTEROL** • 60 softgels	28.00	21.00	19.50	18.00		
01323	**PEAK ATP® WITH GLYCOCARN®** • 60 veg. caps	54.00	40.50	37.50			
00342	**PECTA SOL-C® MODIFIED CITRUS PECTIN** • 454 grams powder	109.95	82.46				
01080	**PECTA SOL-C® MODIFIED CITRUS PECTIN** • 270 veg. caps	79.95	59.96				
01811	**PEONY IMMUNE** • 60 veg. caps	36.00	27.00	24.00			
00673	**PGX® PLUS MULBERRY** (WellBetX®) • 180 veg. caps	34.95	26.21				
01676	**PHOSPHATIDYLSERINE CAPS** • 100 mg, 100 veg. caps	54.00	40.50	36.00			
01436	**POLICOSANOL** • 10 mg, 60 veg. caps	20.00	15.00	11.25			
01953	**POMEGRANATE COMPLETE** • 30 softgels	24.00	18.00	15.75			
00956	**POMEGRANATE FRUIT EXTRACT** • 30 veg. caps	19.50	14.63	13.16			
01797	**POMI-T®** • 60 veg. caps	33.33	25.00	22.50			
01500	**PQQ CAPS W/BIOPQQ®** • 10 mg, 30 veg. caps	24.00	18.00	13.50	12.00		
01647	**PQQ CAPS W/BIOPQQ®** • 20 mg, 30 veg. caps	40.00	30.00	24.00	21.00		
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® NATURAL SEX FOR MEN®** • 60 tablets	52.00	39.00	36.00			
01576	**PREVAGEN®** • 30 caps	60.00	45.00				
*01577	**PREVAGEN® ES** • 30 caps	70.00	60.00				
00525	**PROBOOST™ THYMIC PROTEIN A** • 30 packets	66.60	49.95				

SUBTOTAL OF COLUMN 8

ITEM No.	PRODUCT	Retail Each $	YOUR PRICE 1 Unit Each	4 Unit Each	10 Unit Each	QTY	Total
01441	**PROGESTACARE® FOR WOMEN** • 4 oz cream	35.50	26.63	24.38			
01928	**PROSTATE FORMULA** (Ultra NAT) • 60 softgels	38.00	28.50	26.25	24.00		
01909	**PROSTAPOLLEN™** (Triple strength) • 30 softgels	28.00	21.00	18.75			
01742	**PROTEIN-ISOLATE** (Whey) Vanilla • 403 grams	30.00	22.50	20.25			
01743	**PROTEIN-ISOLATE** (Whey) Chocolate • 1 lb. powder	30.00	22.50	20.25			
01770	**PROTEIN CONCENTRATE** (New Zealand Whey) Vanilla 520 grams	30.00	22.50	19.95			
01771	**PROTEIN CONCENTRATE** (New Zealand Whey) Chocolate 660 grams	30.00	22.50	19.95			
01812	**PROVINAL® PURIFIED OMEGA-7** • 30 softgels	27.00	20.25	18.00			
01508	**PTEROPURE®** Pterostilbene• 50 mg, 60 veg. caps	32.00	24.00	22.50			
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			
01030	**RED YEAST RICE** (Bluebonnet) • 600 mg, 60 veg. caps	16.95	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 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			
01410	**RESVERATROL W/PTEROSTILBENE** • 100 mg, 60 veg. caps	36.00	27.00	24.00			
02031	**RESVERATROL W/NICOTINAMIDE RIBOSIDE** (Optimized) • 30 veg. caps	42.00	31.50	27.00			
02030	**RESVERATROL** (Optimized) • 60 veg. caps	46.00	34.50	31.00			
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			
01609	**RICH REWARDS® BREAKFAST GROUND COFFEE** • 12 oz. bag	13.00	9.75				
01730	**RICH REWARDS® BREAKFAST BLEND GROUND COFFEE** Natural Mocha • 12 oz. bag	15.00	11.25	10.50			
01729	**RICH REWARDS® BREAKFAST BLEND GROUND COFFEE** Natural Vanilla • 12 oz. bag	15.00	11.25	10.50			
01612	**RICH REWARDS® BREAKFAST BLEND WHOLE BEAN COFFEE** 12 oz. bag	13.00	9.75				
01610	**RICH REWARDS® DECAFFEINATED ROAST GROUND COFFEE** 12 oz. bag	14.00	10.50				
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			
01935	**SAMe** (S-ADENOSYL-METHIONINE) 200 mg, 30 enteric coated tablets	25.00	18.75	16.50			
01933	**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
01934	**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			
00046	**SELENIUM** • 2 fl. oz dropper	11.95	8.96				
01679	**SE-METHYL L-SELENOCYSTEINE** • 200 mcg, 100 veg. caps	12.00	9.00	8.25			
00318	**SERRAFLAZYME** • 100 tablets	18.00	13.50	12.00			
01938	**SHADE FACTOR** • 120 veg. caps	44.00	33.00	30.00			
01884	**SILYMARIN** • 100 mg, 90 veg. caps	14.00	10.50	9.50			
01249	**SINUS CLEANSER** • 4 oz. bottle	25.00	18.75				
01596	**SKIN RESTORING PHYTOCERAMIDES w/LIPOWHEAT®** 30 liquid veg. caps	25.00	18.75	17.25			
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	87.00	65.25	58.50			
00432	**STEVIA™** (Better) • 100 packets, 1 gram each	9.95	7.46				
00438	**STEVIA™ ORGANIC LIQUID SWEETENER** (Better) • 2 oz	11.00	8.25				
01476	**STRONTIUM** • 750 mg, 90 veg. caps	20.00	15.00	13.50			
01649	**SUPER ABSORBABLE SOY ISOFLAVONES** • 60 veg. caps	28.00	21.00	18.75			
01778	**SUPER SELENIUM COMPLEX** • 200 mcg, 100 veg. caps	14.00	10.50	9.00	8.25		
	T						
01723	**TART CHERRY EXTRACT W/STANDARDIZED CHERRYPURE®** 60 veg. caps	22.00	16.50	15.00			
01827	**TAURINE** • 1,000 mg, 90 veg. caps	13.00	9.75	9.00			
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	39.95	29.96				
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 (Mint) tube	9.50	7.13	6.50			
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			
02016	**TWO-PER-DAY** • 60 tablets	10.50	7.88	7.13			
02015	**TWO-PER-DAY** • 120 tablets	20.00	15.00	13.50			
02014	**TWO-PER-DAY** • 120 caps	22.00	16.50	15.00			
00326	**L-TYROSINE** • 500 mg, 100 tablets	12.98	9.74				

SUBTOTAL OF COLUMN 10

ITEM No.	PRODUCT	Retail Each $	YOUR PRICE 1 Unit Each	4 Unit Each	10 Unit Each	QTY	Total
	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			
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			
00098	**VITAMIN B5** • 500 mg, 100 caps (Pantothenic Acid)	10.50	7.88	7.04			
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	25.50	19.13	17.44			
00084	**VITAMIN C POWDER** (BUFFERED) • 454 grams	23.95	17.96	16.50			
01736	**VITAMIN C-MAGNESIUM CRYSTALS** (EFFERVESCENT) 180 grams	20.00	15.00	13.50			
01732	**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			
00864	**VITAMIN D3 LIQUID EMULSION** • 2,000 IU, 1 oz.	28.00	21.00	18.75			
01840	**VITAMINS D AND K W/SEA-IODINE™** • 60 caps	24.00	18.00	16.50			
01863	**VITAMIN E** (Natural) • 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 oz	10.00	7.50				
	Z						
01813	**ZINC HIGH POTENCY** • 50 mg, 90 veg. caps	7.95	5.96	5.25			
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			
**01051	**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				
33840	**THE CRWAY® TO GREAT GLUCOSE CONTROL CD** by Paul McGlothin and Meredith Averill • 2016	189.00	189.00				
33890	**FORTIFY YOUR LIFE** by Tieraona Low Dog, MD • 2016	28.89	21.67				
33885	**THE BLUE ZONES SOLUTION** by Dan Buettner • 2015	26.00	19.50				
33880	**OUTSTANDING HEALTH:** THE 6 ESSENTIAL KEYS TO MAXIMIZE YOUR ENERGY AND WELL BEING by Michael Galitzer, MD & Larry Trivieri Jr. • 2015	24.95	18.71				
33878	**TESTOSTERONE REPLACEMENT THERAPY** by Dr. John Crisler • 2015	19.99	14.99				
	SUBTOTAL OF COLUMN 11						

ITEM No.	PRODUCT	Retail Each $	YOUR PRICE 1 Unit Each	4 Unit Each	10 Unit Each	QTY	Total
33877	**THE TRUTH ABOUT MEN AND SEX** by Abraham Morgentaler, MD, FACS • 2015	16.99	12.74				
33876	***TOX*-SICK** • by Suzanne Somers • 2015	26.00	19.50				
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				
33873	**EATING ON THE WILD SIDE** • by Jo Robinson • 2014	16.00	12.00				
33872	**GET SERIOUS** • by Brett Osborn, MD • 2014	24.95	18.71				
33868	**TOXIN TOXOUT:** GETTING HARMFUL CHEMICALS OUT OF OUR BODIES AND OUR WORLD • by Bruce Lourie and Rick Smith • 2014	25.99	19.49				
33867	**THE COMPLETE MEDITERRANEAN DIET** by Michael Ozner, MD • 2014	19.95	14.96				
33869	**UNLEASH THE POWER OF THE FEMALE BRAIN** by Daniel Amen, MD • 2014	16.00	12.00				
33870	**MAGNIFICENT MAGNESIUM** by Dennis Goodman, MD • 2014	14.95	11.21				
DPT05	**DISEASE PREVENTION AND TREATMENT, EXPANDED FIFTH EDITION** (Hardcover) • 2014	69.95	39.95	36.00			
33865	**THE RESTORATION OF THE HUMAN BODY [IN 7 PARTS]** by Sergey A. Dzugan, MD, PhD • 2014	29.95	22.46				
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			
33958	**THE VITAMIN D SOLUTION** by Michael F. Holick, PhD, MD (Paperback) • 2013	16.00	12.00				
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				
33809	**TESTOSTERONE FOR LIFE** by Abraham Morgentaler, MD • 2008	16.95	11.87				
33696	**LIFE EXTENSION REVOLUTION** by Philip Lee Miller, MD (Paperback)	16.00	12.00				
33805	**MIAMI MEDITERRANEAN DIET WITH 300 RECIPES** by Michael D. Ozner, MD, FACC, FAHA (Hardcover) • 2008	24.95	16.25				
33906	**THE MIGRAINE CURE** • by Sergey Dzugan, MD, PhD • 2006	24.00	15.60				
33803	**WHAT YOUR DOCTOR MAY NOT TELL YOU ABOUT DIABETES** by Steven V. Joyal, MD • 2008	14.99	10.49				
	SUBTOTAL OF COLUMN 12						

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