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AS WE SEE IT: NEW HYPERTENSION GUIDELINES
The American Heart Association’s revised blood-pressure guidelines now agree with what Life Extension® has recommended for 30 years. The cost in shortened lives caused by the establishment’s delay in recognizing optimal blood pressure is enormous. Published findings confirm that keeping one’s blood pressure on the low end of the reference range confers significant protection against degenerative conditions.

REDUCE RISK OF ARTERIAL STIFFNESS
Arterial stiffness occurs when arteries lose youthful suppleness. This loss of arterial elasticity is a powerful predictor of mortality. Human studies show that vitamins D and K inhibit arterial calcification and stiffening.

BLOOD-PRESSURE CONTROL AROUND THE CLOCK
In about 35% of adults with hypertension, blood pressure does not fall at night as it should. Researchers have identified ways to lower blood pressure day and night for around-the-clock protection.

A MEDICAL HERO
Dr. Bennet Omalu singlehandedly exposed the neurological dangers of football head injuries. Despite efforts by the National Football League to discredit him, Dr. Omalu ignited a revolution in player safety. He now works to protect millions of nonprofessional athletes from sports-related head injuries.

RAADfest 2018: FINANCIAL REPORT & NEW FORMAT
At this year’s RAADfest, findings will be announced showing reversal of aging factors in humans. The audience will be able to directly interact with speakers and like-minded individuals. The ultimate objective is to outline a systematic protocol for achieving meaningful reversals of pathological aging processes. Also provided is a financial report to demonstrate the nonprofit nature of this annual conference.

7 AS WE SEE IT: NEW HYPERTENSION GUIDELINES
The American Heart Association’s revised blood-pressure guidelines now agree with what Life Extension® has recommended for 30 years. The cost in shortened lives caused by the establishment’s delay in recognizing optimal blood pressure is enormous. Published findings confirm that keeping one’s blood pressure on the low end of the reference range confers significant protection against degenerative conditions.

89 SUPER FOODS: CILANTRO
The novel properties of cilantro make it a tasty, citrus-like herb as well as a source of anxiety relief, heavy-metal elimination, blood-sugar reduction, and defense against infection.

91 AUTHOR INTERVIEW: BARTLEY J. MADDEN: FREE TO CHOOSE MEDICINE
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95 HEALTHY EATING: VEGAN: THE COOKBOOK
The renowned chef of La Mano Verde in Berlin reveals his restaurant’s secret recipes in Vegan: The Cookbook. We provide four delicious—and nutritious—recipes from his collection.
Three natural plant extracts—Cistanche, Pu-erh Tea, and Reishi Mushroom—have been shown to support more youthful immune function.

**Cistanche**
- Supports longer lifespan in animals.¹
- Optimizes the ratio of CD4 to CD8 cells, indicative of a more youthful immune system.¹

**Pu-erh tea**
- Boosts natural killer and naïve T cells while decreasing interleukin-6 (IL-6).²

**Reishi**
- Helps reduce biomarkers of immune senescence.³

For full product description and to order Immune Senescence Protection Formula™, call 1-800-544-4440 or visit www.LifeExtension.com

References

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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 shown to protect lipids and proteins against glycation and the most biologically active form of folate called 5-methyltetra-hydrofolate (5-MTHF), which is up to 7 times more bioavailable than folic acid.*

For full product description and to order BioActive Complete B-Complex, call 1-800-544-4440 or visit www.LifeExtension.com

Reference


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Life Extension® has waged a long battle over what defines optimal blood pressure. Back in the early 1980s, doctors delayed treatment until systolic blood pressure exceeded 150 mmHg. We argued against allowing patients to have blood pressure this high. Our readers were urged to target their blood pressure below 120/80 mmHg.

Against us was a medical establishment that viewed systolic blood pressure of 140-150 mmHg as “normal.” They viewed it as “normal” because most elderly people were in these high ranges.

Our rebuttal was that it is also “normal” for older people to succumb to heart attack, stroke and kidney failure related to higher-than-optimal blood pressure.

On November 13, 2017, at the American Heart Association’s annual conference, revised hypertension guidelines were issued. The new guideline specifies that normal systolic pressure is under 120 mmHg.

We applaud this turnabout, but regret it took over 30 years for this common-sense approach to be recognized. The cost in shortened lifetimes caused by the establishment’s delay in recognizing optimal blood pressure is enormous.

This editorial clarifies these new hypertension guidelines and suggests how to better lower your blood pressure.
As you can see by the chart at the bottom of this page, the majority of Americans aged 65 and older have high blood pressure that is medically defined as hypertension.

With the new hypertension guidelines from the American Heart Association and the American College of Cardiology, an even greater number of Americans are now clinically hypertensive. This will enable more people to take assertive actions to achieve lower blood pressure and reduce their risks of losing their eyesight, suffering kidney failure, and developing coronary-cerebral artery occlusion.

It’s important to note that the study the American Heart Association and the American College of Cardiology most relied on to revise blood pressure guidelines downward involved people at risk for cardiovascular disease. Some argue these findings may not apply to individuals at low risk.

I continue to urge that healthy individuals of all ages strive for low-normal blood pressure readings. I say this based on a volume of observational studies, including data showing that people who have mid-life hypertension are at higher risk of vascular events even when they lower their blood pressure in later life.2-5

Arterial damage is most severe when blood pressure peaks. You don’t get credit for the hours when blood pressure is in low-normal ranges. This is why at-home monitoring of blood pressure at different times of the day is so important.

The charts you see on these pages are from the many Power Point presentations I have given suggesting most people target their blood pressure around Life Extension’s optimal range of 115/75 mmHg.

Another purpose of this editorial is to provide guidance to help ensure that elderly readers do not lower their blood pressure too quickly, as this can create adverse consequences.

Early Data Showed Benefits of Lower Blood Pressure

In year 2013, a published analysis of 18 prior studies showed that people whose systolic blood pressure was in the range of 120-139 mmHg were at a 50% increased risk of coronary heart disease and 71% increased risk of stroke.7

The studies analyzed in this 2013 report are among those that Life Extension used long ago to recommend that optimal systolic blood pressure for most individuals is around 115 mmHg.

Mainstream medicine during this pre-2017 era did not classify people with systolic readings of 120-139 mmHg as hypertensive.

The tragic results, based on observational studies, are many preventable heart attacks, strokes, and other degenerative conditions that can occur when systolic pressure exceeds 119 mmHg.8-10

The systolic number is most important as this reflects the

Severity of the Epidemic

Persons defined as hypertensive by CDC:6

<table>
<thead>
<tr>
<th></th>
<th>65-74 years</th>
<th>75 years and over</th>
</tr>
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<tbody>
<tr>
<td>Men</td>
<td>63.4%</td>
<td>72.3%</td>
</tr>
<tr>
<td>Women</td>
<td>64.3%</td>
<td>79.9%</td>
</tr>
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</table>

These data published by the Centers for Disease Control and Prevention in 2016 reflect the percent of hypertensive Americans based on antiquated reference ranges that diagnosed hypertension when blood pressure reached 140/90 mmHg.

The new guidelines stating optimal systolic pressure is under 120 mmHg will cause the percent of Americans classified as hypertensive to skyrocket, which should enable a marked reduction of vascular disease risk.
The name of this study is Systolic Blood Pressure Intervention Trial, also known as SPRINT. It was published in the New England Journal of Medicine in 2015 and garnered huge media coverage.

The SPRINT study was supposed to last five years, but was stopped after 3.26 years because it was abundantly clear that the group whose blood pressure was reduced to a target systolic range under 120 mmHg were dying 27% less frequently. What impressed the study’s researchers the most was a striking 43% lower relative risk of cardiovascular death in those whose blood pressure was aggressively reduced.

Decades of published data reveal that low-normal blood pressure slashes heart attack and stroke risk. This 2013 analysis shows the lethal impact of systolic blood pressure ranges of 120-139 mmHg, a level previously termed “prehypertension.”

On November 13, 2017, the American Heart Association and the American College of Cardiology abolished the term “prehypertension.” Anyone with systolic pressure above 119 mmHg is classified as having “elevated” blood pressure.

The studies compiled for publication in 2013 were not enough for establishment cardiology to pay attention. They wanted to see hard data from a carefully controlled clinical trial.

The sought-after trial was initiated in 2010 with a large group of people. The purpose was to assess whether targeting a reduction of systolic blood pressure below 120 mmHg was superior to the then-current standard of reducing it to below 140 mmHg.

The doctors focused on the systolic (top) number because it is a better predictor of heart attack and stroke.

The Study That Woke Up the Medical Establishment!

压力施加于动脉系统与每次心跳。较高的动脉压力会导致更大的损伤内皮、肾小管和微小结构在眼中。

致命影响的收缩压120-139毫米汞柱

2013年的一项分析了18项研究，其中收缩压在120-139毫米汞柱之间，与相关的风险增加的比率：

- 50% 增加冠心病的风险
- 71% 增加中风的风险

几十年来的数据表明，低正常血压可以降低心脏病和中风的风险。这一2013年的分析显示了收缩压范围的致命影响，120-139毫米汞柱，一个水平上被称作“预hypertension”。

这张图表显示了当收缩压目标在120毫米汞柱以下与在140毫米汞柱以下的死亡和疾病减少。
As We See It

Benefits of Lower Blood Pressure Confirmed in 2015

Compared to people with a target systolic blood pressure below 140 mmHg, subjects with target blood pressure below 120 mmHg had:

- 38% lower risk of heart failure
- 43% lower risk of cardiovascular death
- 27% lower overall mortality

The SPRINT study published in 2015 confirmed that targeting systolic blood pressure below 120 mmHg results in substantial reductions in heart disease and lower overall death rates.

Heart disease remains the number-one cause of death in the United States, killing about 610,000 Americans each year.

The dramatic (43%) drop in cardiovascular deaths shown in the SPRINT study motivated mainstream cardiologists to question their long-standing practice of largely ignoring their patient’s blood pressure until readings exceeded 139/89 mmHg.

Based on widespread media coverage and physician concurrence, it appears the medical establishment has finally woken up to what readers of this publication were told to do in the 1980s.

Safety Concerns When Blood Pressure is Lowered too Much

Older individuals face a dilemma when it comes to rapid blood-pressure reduction.

Decades of systolic blood pressure above 115 mmHg, along with risk factors in the blood such as C-reactive protein, homocysteine and triglycerides can damage the delicate endothelium that lines the inner arterial wall.

As a result of prior arterial injury, some older people need to maintain higher-than-optimal blood pressure to ensure their kidneys are sufficiently removing waste products, and that their brain is receiving sufficient oxygen flow.

The SPRINT study also found that heart failure rates plummeted by 38% in patients whose target blood pressure aimed below 120 mmHg. Heart failure occurs when the heart cannot pump enough blood and oxygen to support other organs in one’s body. It is a leading cause of hospitalizations and costs this nation an estimated $32 billion each year.

Heart disease remains the number-one cause of death in the United States, killing about 610,000 Americans each year.

The dramatic (43%) drop in cardiovascular deaths shown in the SPRINT study motivated mainstream cardiologists to question their long-standing practice of largely ignoring their patient’s blood pressure until readings exceeded 139/89 mmHg.
In the SPRINT study that convinced the American Heart Association and the American College of Cardiology to adopt lower systolic guidelines (below 120 mmHg), there was an increase in the risk of kidney problems.

**Practical Steps to Blood-Pressure Control**

I continue to be shocked by antiquated recommendations made by organizations like the American Heart Association.

In revising their definition of optimal systolic pressure to below 120 mmHg, the American Heart Association suggests people have their blood pressure tested once every two years at their doctor’s office. This suggestion makes no sense considering that low-cost at-home monitors are widely available and are proven to enable superior 24-hour blood-pressure control.

There is extensive individual variability in patient responses to blood-pressure lowering therapies. Some people need twice-a-day drug dosing, or only need to take their medications in situations when their blood pressure elevates (such as when drinking caffeine or under stressful events or during particular times of the day/night).

I have vociferously argued for decades that systolic blood pressure should be below 120 mmHg. I am equally confident that most readers of this magazine can better control their blood pressure using an at-home monitor. This enables precise control of drug dosing and offers the ability to measure the effects of lifestyle changes like losing weight, healthier diets and getting more physical activity.

**Blood Tests Measure Kidney Function**

For those who now seek to aggressively drop their systolic reading to below 120 mmHg, we urge this be done slowly, using an at-home monitor to carefully control the rate of blood-pressure reduction.

As blood-pressure readings drop, check your blood markers of kidney function using low-cost blood tests that measure creatinine, blood urea nitrogen (BUN), glomerular filtration rate and lots more. Blood test panels that include these measures of renal function cost very little.

If blood-test results indicate a kidney problem, cut back on your blood pressure reduction program, consult your physician and retest within two weeks.

**An Important Overlooked Fact**

An underappreciated problem that has been ignored by SPRINT study advocates has been the manner in which blood pressure was measured in SPRINT.

Specifically, the study used an automated measurement device, the Omron 907XL.

“In SPRINT, study staffs were trained to program an Omron 907XL, to wait five minutes and then record three readings at one-minute intervals. After the device was activated, research staff left the examining room, with the patient then being alone during the five-minute rest period while the three readings were recorded automatically.”

This protocol is very different from the method used in the vast majority of physician’s offices where a single measure of blood pressure is taken with medical staff present in the room.

Automated blood-pressure measurements generally deliver readings significantly LOWER than readings in a physician’s office.

This suggests that the SPRINT systolic values obtained were on average 7 to 10 mmHg lower than blood pressure measured in routine clinical practice.

Taken as a whole, this also suggests that systolic blood pressure as measured in recent randomized trials, including SPRINT, is up to 10 systolic points LOWER than that measured with traditional office measurement methodology.

The consequence is that targeting systolic blood pressure below 120 mmHg without using similar measurement automated methods (as in SPRINT) may increase the risk of adverse events. This might occur by overshooting the SPRINT trial-based systolic blood-pressure targets and potentially leading to hypotensive complications.

Stated another way, a systolic blood pressure of 120 mmHg in conventional practice would be roughly the equivalent of a systolic blood pressure of 110 mmHg in SPRINT. Conversely, a blood pressure of 130 mmHg systolic in conventional practice is roughly the equivalent systolic blood pressure of 120 mmHg in SPRINT.

This suggests that blood-pressure readings over 120 mmHg using conventional testing are not as dangerous as what the SPRINT findings showed.

These data suggest that more precise blood pressure monitoring may enable aging individuals to benefit from superior hypertension control. We believe many people can better achieve this using an at-home blood pressure monitor.
The most accurate measure of renal health is the cystatin-c blood test. This costs more than standard CBC/Chemistry blood tests, but for those at risk for renal complications, we have long advocated its use.

These blood tests can be ordered 24 hours/day by calling 1-800-208-3444 or logging on to LifeExtension.com/labtesting.

Protecting the Brain against Reduced Oxygen Flow

Aggressive blood pressure reduction can create problems for certain elderly, frail people.

Older patients with significant pre-existing vascular disease and other medical problems often require higher blood pressure to perfuse critical organs like the brain.

These patients require a higher perfusion pressure to allow blood to reach critical organs and tissues throughout the body.

We described the phenomenon in previous issues of Life Extension Magazine®, whereby some older patients do not tolerate aggressive blood pressure reduction to a predefined value (such as under 120 mmHg).

These individuals require careful monitoring using blood tests as well as assessments of cognitive function.

These tests are necessary to facilitate appropriate dosing of antihypertensive medications to a blood pressure that can be tolerated by these patients.

When lowering one’s blood pressure, one should be cognizant of dizzy spells, memory lapses, and perceived loss of motor coordination (frailty).

Ideally, one would have clinical measures performed using a standardized frailty index score, but this is not available from most physicians.

Nutrients most readers of this magazine take, along with healthy diets containing plant-based polyphenols, can protect and help restore cerebral circulation.

Those embarking on an aggressive blood-pressure reduction program may also consider a periwinkle-derived alkaloid called vinpocetine that has been used for decades in Europe by those with chronic cerebral hypoperfusion.

Blood-Flow-Restoring Effects of Vinpocetine

Cerebral ischemia (loss of blood flow) can lead to irreversible brain damage. It is therefore important to rescue hypoperfused areas of the brain whenever possible.

A review was conducted on the effects of vinpocetine on chronic cerebrovascular patients. Studies included cerebral perfusion imaging and clinical assessments of cognitive function after single dose and long-term vinpocetine use.

The results from these clinical trials showed that vinpocetine increased cerebral perfusion, elevated brain-cell consumption of glucose-oxygen, and improved other measures of neurological function.

This analysis showed that vinpocetine improves blood flow to hypoperfused areas of the brain and enhanced quality-of-life scores.

My personal rebuttal to these studies is that diabetics should do more to reverse their glucose/insulin imbalances, along with other known vascular risks.

View Our Updated Hypertension Protocol Online

An enormous volume of data has been published in recent years that relate to what groups of aging people most benefit from with blood-pressure reductions, along with better ways of achieving optimal control.

We’ve analyzed and compiled this data, which you can view at no charge by logging on to LifeExtension.com/hypertension-protocol.

An example of what you’ll read relates to what diabetics should do when their blood pressure is too high. Current evidence suggests that there may be adverse effects when diabetics are overly aggressive in reducing only moderately elevated blood pressure.

Nutrients Versus Drugs

There are a wide variety of nutrients that produce modest blood pressure-lowering effects.

If your systolic pressure is around 125 mmHg and you seek to bring it down to the 115 mmHg range, you might be able to accomplish this by losing a little weight, improving your diet, exercising more, and supplementing with quercetin and melatonin.
The Turning Tide of Medical Opinion

Fascinating reviews about the history of hypertension can easily be obtained via Google searches. As recently as 1949, an esteemed physician published that systolic blood pressure over 200 mmHg need not be treated.30 In the 1980s, many doctors accepted systolic readings of 160 mmHg as normal and did not treat it.31

The revised 2017 guidelines that normal systolic pressure is under 120 mmHg will spare many humans from disability and death. An abundance of published findings confirms that keeping one’s blood pressure on the low end of the reference range confers significant protection against a host of degenerative conditions. The easiest way to accomplish this is with an at-home blood-pressure monitor. This enables you to assess your blood pressure at several different times of the day to ensure there are no significant elevations above 119 mmHg.

The box on this page is a description of a recent study showing vastly superior results when people check their blood pressure at home, rather than waiting for their next doctor’s visit.

For longer life,

William Faloon, Co-Founder
Life Extension Buyers Club

For many people, however, they will need the appropriate prescription medication to achieve optimal blood-pressure goals. The long history of use with these drugs and their low cost causes us to recommend certain drugs that not only safely lower blood pressure, but confer other benefits such as improving endothelial function.

In the March 2015 issue of Life Extension Magazine, we published a report on a generic drug called telmisartan that we felt was the best antihypertensive drug for most individuals to consider.29

With the availability of low-cost at-home blood-pressure monitors, there is no longer a need to speculate as to what approach one should take.

If lifestyle changes and/or nutrients enable one to achieve optimal readings (115/75 mmHg), then prescription drugs are obviously not needed for blood-pressure control. If systolic pressure remains persistently above 119 mmHg, then 40 mg a day of telmisartan (and/or other medications your physician prescribes) should be attempted. Telmisartan doses can be increased to 80 mg/day if needed.

Unlike many drugs the FDA approves that are side-effect prone and don’t work particularly well, certain antihypertensive medications have lifesaving properties that cannot be overlooked if one’s blood-pressure readings remain higher than optimal.

Importance of At-Home Blood-Pressure Monitoring

Monitoring blood pressure outside of the doctor’s office is emerging as a standard of care for high blood pressure, as it helps to more accurately diagnose and track treatment efficacy.32

Everyone who has been diagnosed with high blood pressure should have an at-home monitor in order to ensure that any intervention they are undertaking is working to help keep their blood-pressure readings around 115/75 mmHg throughout the day.

The importance of regular at-home blood-pressure monitoring cannot be overstated.

In fact, monitoring your blood pressure at home may help you better control it, possibly obviating the need to increase medication dosage.

In a randomized controlled trial, 136 participants with uncontrolled high blood pressure were assigned to at-home blood-pressure monitoring or usual care; their medication regimen was not modified.33

Those who regularly monitored their blood pressure at home saw significant reductions in systolic and diastolic blood pressure compared with those who did not self-monitor.

At the end of the two-month trial, 32.4% of the self-monitoring (at-home) group had blood pressure of less than 130/80 mmHg, while only half as many participants—16.2%—who did not self-monitor saw their blood pressure fall below this level.33

Several other studies have found similar benefits associated with at-home blood-pressure monitoring.34-37
References

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Grilled Meat Linked With Higher Mortality for Breast Cancer Survivors

A new study shows a link between higher consumption of barbecued, grilled, and smoked meat and increased risk of mortality for survivors of breast cancer.*

It was previously known that meats cooked in various ways at high temperatures are high in cancer-related substances and linked to breast cancer. The new study, led by Humberto Parada, Jr., MPH, scrutinized the effect of these foods specifically on 1,508 women who had already survived the disease.

The subjects were questioned concerning their consumption in each decade of their lives of four types of barbecued, grilled and smoked meat, and were asked to specify in which seasons these foods were most frequently eaten. In a follow-up five years later, the subjects were asked to provide the same information regarding their meat-eating habits since the previous interviews had been conducted.

Researchers found that, compared to subjects with low consumption of the meats in question, both pre- and postdiagnosis, high consumption was associated with a 31% increased risk of all-cause mortality.

Additionally, high consumption before diagnosis was associated with a 23% higher risk of all-cause mortality, and high smoked-meat consumption specifically was linked with a 17% increased risk of all-cause mortality and a 23% increased risk of breast-cancer mortality.

This study corroborates warnings to the public from Life Extension* concerning these risks from as far back as 2003.

Editor’s Note: All-cause mortality risk in this study was found to be at similar levels for women who reported high prediagnosis barbecued, grilled, and smoked meat consumption but low postdiagnosis consumption.

Testosterone Replacement Therapy Improves Sexual Function

Recent research documents improvements in sexual function, urinary function and quality of life among men who received testosterone replacement therapy.*

The prospective study involved 656 men (average age of 60.7 years) with low testosterone levels and symptoms of testosterone deficiency, among whom 360 were regularly treated with testosterone for up to 10 years. The remainder of the subjects, who chose not to be treated with testosterone, underwent biannual routine clinic visits.

The researchers found that men who received testosterone therapy experienced significant decreases in their International Prostate Symptom Score, post-voiding bladder volume and Aging Males Symptoms scale, which assesses health-related quality of life. The percentage of patients without erectile dysfunction significantly improved in the testosterone treated group, from 17.1% at the beginning of the study, to 74.4% of the study at the last visit.

Editor’s Note: In contrast, subjects who did not receive the hormone experienced deterioration in erectile function as well as in voiding functions.

Whey Protein Could Help Maintain Muscle

A study reported in the journal *PLOS ONE* found positive effects for supplementation with whey protein in combination with calcium, creatine, omega-3 polyunsaturated fatty acids and vitamin D in the muscles of older men.*

The study included 49 men aged 70 years and older who received the whey-based supplement combo or a placebo for six weeks. At the end of the six-week period, the participants continued their regimens while engaging in a resistance and high-intensity interval training program for 12 weeks.

At the end of the first six weeks, those who received whey experienced an increase in lean body mass as well as strength. While both groups experienced gains in strength during the second phase of the study, those who received the whey-based supplement combination had greater upper body strength than the control group.

**Editor’s Note:** The gradual loss of muscle that occurs with aging known as sarcopenia is associated with frailty, falls and disability in late life.

* *PloS One. 2017 Jul 18;12(7):e0181387.*
An article published in The FASEB Journal reported that supplementation with a polyphenol found in green tea, epigallocatechin-3-gallate (EGCG), helped alleviate adverse effects of a high-fat and high-fructose diet in mice.*

The finding could be of significance to millions of individuals who consume a Western diet, which is high in fat and added sugars.

Three-month-old mice were fed a standard diet or a high-fat, high-fructose diet with or without the addition of EGCG.

After 16 weeks, water maze testing revealed a protective effect for EGCG supplementation against memory impairment in mice that received the high-fat and fructose diet.

This green tea polyphenol (EGCG) was also associated with protection against diet-induced neuronal damage.

Neuroinflammation was lowered by EGCG via inhibition of MAPK and NF-kB pathways, in addition to decreased expression of the inflammatory mediator tumor necrosis factor-alpha.

Editor’s Note: In neuronal cell cultures, elevated glucose and insulin resistance were reduced by EGCG via improvements in oxidized cellular status and mitochondrial function.

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• Support healthy immune function,
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New Zealand Whey Protein Concentrate (Chocolate)
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References

Contains milk.

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Aspirin 81 mg
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Do not exceed recommended dosage. Drink a full glass of water with each dose. Adults and children 12 years of age and over: take 4 to 8 tablets every four hours not to exceed 48 tablets in 24 hours, unless directed by a doctor. Children under 12 years of age: consult a doctor. Reye's syndrome: Children and teenagers who have or are recovering from chicken pox or flu-like symptoms should not use this product. When using this product, if changes in behavior with nausea and vomiting occur, consult a doctor because these symptoms could be an early sign of Reye's syndrome, a rare but serious illness.

Keep out of reach of children. In case of overdose, get medical help or contact a Poison Control Center right away.

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On a daily basis, our DNA is under attack from numerous sources, including radiation, oxidative stress, environmental hazards, and dietary carcinogens.

The extent to which DNA damage occurs—or can be prevented—correlates closely with how long we will live.¹

One course of action is to protect ourselves with compounds that can prevent DNA damage before it leads to cancer.

Based on extensive research, scientists have discovered a natural hops-derived flavonoid compound, xanthohumol, that has been shown in clinical (human) studies to reduce DNA damage in cells²-⁴—which may reduce the risk of cancer.

Two additional compounds—chlorophyllin and watercress extract—have been recognized for their multitargeted capacity to reduce DNA damage.

The combination of these targeted compounds may offer the best possible natural protection against age-accelerating, cancer-inducing damage to our DNA.

This is especially important for those who occasionally or routinely ingest overcooked foods and other dietary constituents that inflict considerable harm to our cellular DNA.
DNA Damage and Cancer

Genetic mutations that occur as a result of DNA damage increase the risk of developing cancer.\(^5\text{-}^7\)

Cancer is the second leading cause of death in Americans.\(^8\) Abundant citations in the scientific literature focus on DNA damage and its prevention as a way to protect against malignancies.

Scientists are excited about research on the DNA protective benefits of a flavonoid present in hops, xanthohumol.

Research data show that xanthohumol has a cancer-prevention profile and acts by a variety of mechanisms to prevent cancer initiation. The compound’s ability to prevent DNA damage has scientists most intrigued.\(^2\text{-}^4\text{,}^9\text{-}^{12}\)

Two recent human studies highlight the impact of xanthohumol on reducing DNA damage.

Impressive Protection Against DNA Damage

In a randomized, placebo-controlled clinical trial, 22 healthy individuals drank a malted beverage containing 12 mg of xanthohumol or a placebo for 14 days.\(^10\)

Subjects had their blood and urine collected before, during, and after the supplementation period.\(^10\)

The researchers were specifically looking for changes in DNA stability in white blood cells, as well as the urinary excretion of damaged fragments of DNA and of reactive oxygen species.

This phase of the study showed that subjects drinking the xanthohumol beverage experienced a remarkable reduction in DNA damage compared with those drinking the placebo.\(^10\)

By the end of the 14-day study, the effect reached a reduction of 33% in DNA damage.

DNA Protection Under Pressure

Next, the researchers wanted to find out how well xanthohumol would equip cells with resistance to DNA breaks under conditions of chemical stress. To test this, they exposed subjects’ cells to hydrogen peroxide, a potent generator of the reactive oxygen species that impose DNA-damaging chemical stress.

Xanthohumol did not disappoint.

Once again, cells from xanthohumol-supplemented subjects proved markedly resistant to chemically-induced DNA damage compared with those from placebo recipients. This time a significant effect was evident by Day 7, and climbed to a maximum 53% reduction in DNA damage at the end of the study period.

In order to be certain that it was the xanthohumol that was responsible for this protection and not some other component of the test beverage, the researchers carried out a second phase of the study using a capsule of purified xanthohumol at the same 12-mg dose.\(^10\)

This second phase demonstrated similar results: The pure xanthohumol produced a 39% reduction in DNA damage, and a 28% improvement in the resistance to DNA damage induced by hydrogen peroxide.\(^10\)
Protection Against Dietary Carcinogens

The same group of scientists then carried out a follow-up study, pushing xanthohumol’s protective effects even harder. This time, they evaluated how well the supplement works against the everyday challenge of dietary carcinogens.

To test this, 22 participants consumed a drink containing 12 mg of xanthohumol. The researchers then stressed the subjects’ DNA by exposing blood cells to representatives of three major classes of DNA-damaging dietary carcinogens:

- N-Nitrosodimethylamine (NDMA)
- Benzopyrene
- 2-amino-3-methylimidazo[4,5-f]quinolone (IQ) (a type of heterocyclic amine)

The xanthohumol led to reductions in DNA damage caused by NDMA, benzopyrene, and the heterocyclic amine.

And when the researchers conducted a follow-up trial using xanthohumol capsules (instead of the drink), it once again showed similar reductions in DNA damage in the face of each compound.

This study is of great importance because it elucidates some of the molecular mechanisms by which xanthohumol may protect human cells from the first step in carcinogenesis: the DNA damage that mutates the genetic code and provides the spark needed to trigger malignant transformation.

Xanthohumol Prevents Precancerous Lesions

Animal studies have gone the next step in demonstrating the chemoprotective effects of xanthohumol. They have shown that in addition to preventing DNA damage, xanthohumol also prevents the development of precancerous lesions.

To prove this effect, researchers exposed xanthohumol-supplemented healthy rats to a common family of dietary carcinogens (called heterocyclic amines) that forms when meat is cooked at high temperatures.

Heterocyclic amines have been linked to breast, prostate, colorectal, gastric, and pancreatic cancers.

In this study, the xanthohumol-supplemented animals experienced a significant 50% reduction in the number of precancerous sites in their livers, and a 44% decrease in the size of the lesions, demonstrating a robust effect. Not surprisingly, the researchers found evidence that the supplement achieved these results by preventing DNA damage in liver cells.

These human and animal studies show that xanthohumol protects DNA from damage both directly from chemical stress and indirectly from dietary carcinogens.
Broadening the Spectrum of DNA Protection

Humans aren’t alone in our need for DNA protection. All living things are challenged in protecting against DNA damage, including plants and animals. Plants face even greater risks than animals do in this regard because they can’t seek shade, water, or nourishment when DNA-threatening environmental stress sets in. This means that plants are naturally rich in biochemical DNA-protective compounds. That’s good news for humans, because these plant compounds seem to work as well in our cells as they do in theirs.

Several plant species and extracts are especially known for their ability to defend DNA against the chemical, radiation, and other stresses that threaten its integrity.

Chlorophyllin

Chlorophyllin is a water-soluble derivative of chlorophyll, a pigment that makes plants green and captures light and channels it safely into energy within plant cells.

Studies show that chlorophyllin exerts powerful protection against DNA damage. Like most natural compounds, chlorophyllin acts by multiple mechanisms, one of which is by blocking carcinogens and making them less bioavailable.

This benefit was vividly seen in two studies showing chlorophyllin’s ability to protect against the damage caused by two known DNA-damaging carcinogens: aflatoxins and heterocyclic amines.

The first study examined people who had an elevated risk of liver cancer because of their consumption of aflatoxin-contaminated foods. In this study, taking chlorophyllin led to a 55% reduction in median urinary levels of a marker of aflatoxin-induced DNA damage.

The second study evaluated chlorophyllin’s ability to protect against the damage caused by heterocyclic amines. The results showed that chlorophyllin significantly reduced DNA damage in colorectal cells following a meal of meat cooked at high temperatures, a dangerous source of cancer-causing heterocyclic amines.

Watercress

Watercress is a cruciferous vegetable, a group of plants widely recognized for their multitargeted anticancer activities. Watercress extracts are rich in antioxidants capable of fighting the oxidative stress that damages DNA.

In human studies, supplementation with watercress significantly reduced DNA damage by up to 24% in healthy volunteers. This benefit was seen both at rest and following vigorous exercise, which is known to briefly but powerfully induce DNA damage by oxidative stress.

This indicates the potential of watercress to protect DNA in stressful situations that could otherwise lead to dangerous DNA damage.
Summary

DNA damage is ubiquitous and deadly. While it is best known for its role in cancer development, it is also implicated in a wide range of aging processes.

Xanthohumol, a compound found in hops, has now been shown in human and animal studies to significantly reduce DNA damage induced both by natural chemical stresses, as well as by some notorious dietary carcinogens.

In addition, chlorophyllin and watercress have been shown to reduce DNA damage via several mechanisms.

Fortunately, science has identified powerful nutrients that protect against DNA damage and its consequences.

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

References

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- Watercress extract
- Chlorophyllin

DNA Protection Formula
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DHEA 15 mg capsules

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DHEA 25 mg capsules

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Caution: Consult a physician or licensed, qualified healthcare professional before using these products if you have, or have a family history of, breast cancer, prostate cancer, or other hormone-sensitive diseases.

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Overlooked Dangers of Insulin and Glucose Spikes

After a meal, blood-glucose levels increase and our pancreas responds by secreting insulin.

In youth, there is a delicate balance that drives glucose into cells mostly for energy production. Once blood-glucose levels drop to a fasting range, insulin production subsides.

With age, a sedentary lifestyle, and a diet featuring refined carbohydrates and simple sugars, our cells become insulin resistant, which allows blood-glucose levels to rise.

Rising glucose levels trigger the pancreas to release more insulin to counter the glucose—creating a vicious cycle.1

These factors promote weight gain and other metabolic disturbances.

As weight accumulates, fat cells pour out cytokines, which generate inflammation throughout the body.2,3

The medical term for this condition is hyperinsulinemia. It sets the stage for age-related diseases like atherosclerosis, hypertension, lipid abnormalities, type II diabetes, obesity, and cancer.4-15

Two plant extracts have been identified that block damaging insulin and glucose surges. In human trials, one of these extracts slashed after-meal insulin by 56% and after-meal glucose by 15%.

After-meal spikes in blood glucose are an important indicator of glycemic control. One of these plants extracts completely reversed the glucose surge within two hours.

Since insulin is required to sustain life, the public mistakenly sees this hormone in a favorable light.

As you will learn in this article, too much insulin not only contributes to weight gain, but to a multitude of diseases associated with obesity.
Excess blood levels of the hormone **insulin** occur in response to poor dietary choices, lack of physical activity and normal aging.

The medical term that defines the pancreas over-secreting insulin is **hyperinsulinemia**. Excess insulin remaining in the blood after a meal has been identified as a major cause of nonalcoholic fatty **liver disease**.\(^{16,17}\)

**Hyperinsulinemia** is an independent risk factor for **kidney disease** among metabolic syndrome patients.\(^{18}\)

High insulin blood levels are predictive of **type II diabetes** and strongly associated with **obesity**.\(^{19,20}\)

**Link Between Elevated Insulin and Cancer**

A number of published studies indicate that **high insulin** levels drive the development and progression of many types of malignancies.\(^{2,21,22}\)

**Human** studies implicate high insulin levels in at least seven common **cancers**:

- Colorectal cancer: **17% to 42%** greater risk of precancerous adenomas\(^{23-25}\)
- Breast cancer: **2- to 3-fold** higher risk\(^{27}\)
- Stomach cancer: **69% to 101%** higher risk\(^{26}\)
- Endometrial cancer: **45-fold** greater risk for type I endometrial (uterine lining) cancer\(^{28}\)
- Ovarian cancer\(^{29}\)
- Prostate cancer: **2.55-fold** risk of malignancies\(^{30}\) and a **5.62-fold** risk of locally advanced tumors\(^{31}\)
- Liver cancer: **2.4-fold** risk among those with both hepatitis B and high insulin levels,\(^{32}\)

Elevated insulin levels are associated with the development of more aggressive and metastatic cancers that carry a grim prognosis.\(^{33,34}\)

These alarming figures have inspired researchers to find out why there’s such a close connection between high insulin levels and cancer. And in just the past few years, researchers have uncovered mechanisms behind this deadly insulin/cancer connection.

**Why Insulin Promotes Cancer**

High levels of insulin trigger rapid cell division, while at the same time elevated blood sugar and fat levels provide metabolic fuel for tumor expansion.\(^{2,35}\)

In response to chronically elevated insulin/glucose some cells lose control of their DNA regulatory genes—which is the hallmark of malignancy. This sequence of events is believed to promote cancer, at least in colon cells and possibly in those throughout the body.\(^2\)

By its very nature, insulin is a **growth factor**, which means it naturally stimulates cell growth. The problem is that once a cancer cell has emerged, too much insulin results in overstimulation. This results in greater proliferation, migration, and invasiveness of cancer cells—all of the factors that make them so deadly.\(^{33,36}\)

These cancer-promoting effects of insulin were shown vividly when scientists injected colon cancer cells into mice and then fed them either a normal or high-calorie diet. The high-calorie-diet mice had elevated levels of insulin and other growth-promoting molecules. As a result, their tumors grew to **twice** the size of tumors in the normal-diet group—**in just 17 days**.\(^{37}\)

Another reason excess insulin promotes cancer is because it causes damaging **oxidative stress**.

When researchers applied a small amount of insulin to cell cultures, enough oxidative stress was generated from just a **single exposure** to damage DNA strands.\(^{34,36}\) When they extended the exposure to six days, the amount of insulin required to induce similar damage was reduced by a **factor of 10**.\(^{36}\) This demonstrates how **chronically elevated** insulin rapidly escalates DNA damage.

Studies have also revealed a close relationship among body size, type II diabetes, and many cancers.\(^{2,21}\) A diet rich in readily digested sugars and carbohydrates,
for example, has been shown to increase the risk of developing a common form of breast cancer (estrogen receptor-negative) by 36%–41%.35

The connection between high insulin levels and cancer adds a strong rationale to suppress after-meal insulin and glucose surges.

In a timely development, scientists have demonstrated two plant extracts that target after-meal insulin and glucose levels.

Maqui-Berry Extract Slashes After-Meal Insulin and Glucose

Maqui-berry extracts have been shown to decrease after-meal rises in both glucose and insulin.

Research suggests that a proprietary extract of maqui berries contains potent compounds known as delphinidins.

Delphinidins stimulate a peptide that lowers after-meal blood glucose and can help moderate insulin spikes. The peptide stimulated by maqui-derived delphinidins is glucagon-like peptide-1 (GLP-1).38

GLP-1 slows and delays stomach-emptying, so glucose from a meal reaches the absorptive tissue in the small intestine later, and in lower quantities, than it would otherwise.39,40

In a human trial, ten volunteers were enlisted whose fasting glucose levels were normal (under 100 mg/dL) but whose after-meal glucose levels, after a standard white rice meal, were between 100 mg/dL and 125 mg/dL (considered altered glucose tolerance).41

Participants took either a placebo or 200 mg of maqui-berry extract 30 minutes before eating a small meal of 75 grams (about 2.5 ounces) of white rice, calculated to produce a rise in after-meal glucose levels.

The placebo group’s after-meal glucose levels peaked after one hour, at about 115 mg/dL.

By contrast, the after-meal glucose levels in the maqui-berry group had only risen to 98 mg/dL after one hour, a 15% difference. As an added benefit, their glucose levels did not peak for a full two hours after the meal. Even then, they reached a high of about 107 mg/dL.41

The effect on insulin levels was more dramatic. After the meal, insulin concentrations in the placebo group rose steadily until they reached an average of 25.33 μIU/ml after one hour. In sharp contrast, the maqui-extract group’s insulin levels increased much more slowly, reaching an average of only 11.22 μIU/ml after an hour—a compelling 56% lower insulin level!41

In fact, insulin levels in the maqui-extract group did not peak until a full hour and a half after the meal. Even then, it peaked at a much lower level than the placebo group.41

What You Need to Know

Block After-Meal Insulin and Glucose Surges

• Modern medicine’s reliance on fasting plasma-glucose tests for yearly examinations means that lethally high after-meal insulin and glucose levels are often missed for years.

• By the time glucose abnormalities are caught, excess insulin has likely already caused immense damage.

• Fortunately, maqui-berry extract has been verified in human studies to delay glucose absorption—crushing after-meal insulin by up to 56% and glucose by 15%—and to lower HbA1c readings by 0.3% (from 5.65% to 5.35%).

• Additionally, human research demonstrates that a natural clove extract inhibits hepatic glucose release, reversing after-meal glucose within two hours.
Maqui-Berry Extract Reduces Long-Term Glucose Levels

A separate study showed that maqui-berry extract can impact chronically elevated glucose levels as well.42

For the study, a group of newly identified prediabetic individuals took 180 mg of standardized maqui-berry extract every morning for 90 days. Follow-up tests occurred at 30, 60, and 90 days.42

On follow-up testing days, researchers measured the participants’ hemoglobin A1c (HbA1c) blood levels. Unlike an after-meal glucose reading, which tells you what your glucose levels are at that moment in time, the HbA1c measures how high glucose has been over the past three to four months. The normal value for HbA1c is 5.6% or lower.43

The researchers documented that maqui-berry extract reduced HbA1c levels by 0.3% (from 5.65% to 5.35%).42

No serious adverse events were observed in either of these clinical trials.41,42

Clove Extract Prevents Glucose Spikes

Clove extract is an excellent complement to maqui berry because of its impressive ability to control after-meal blood glucose.

In an exciting study, investigators found that a water-soluble extract of the clove flower bud (Syzygium aromaticum) reduced after-meal blood sugar.44

Clove extract contains polyphenols that can regulate glycogen phosphorylase, the enzyme responsible for releasing glucose into the bloodstream that is stored in the liver and muscles in the form of glycogen.45

This typically happens under stress or low nutrient availability. But with aging, too much stored glucose is often chronically released from liver stores.

Inhibiting glycogen phosphorylase with clove can help block excess glucose release into the bloodstream.

These benefits were seen when clove extract was given to diabetic mice, where it suppressed both blood-glucose elevations and HbA1c readings.45

But would it reduce after-meal glucose spikes in humans as well?

To answer that question, scientists divided a group of healthy volunteers into two groups according to baseline glucose levels: one with normal glucose levels and one with high-glucose. All subjects received 250 mg of clove extract daily for 30 days.44

Random blood-glucose levels were measured before supplementation, and again on days 12, 24, and 30. Additional blood draws were done two hours after a typical lunch.44

For both groups, glucose readings fell significantly at day 12—and they continued to drop throughout the study until the after-meal glucose values were about the same level as the before-meal values!44

The high-glucose group showed greater improvement, indicating greater benefit for this at-risk population. No one experienced abnormally low blood-glucose, making clove extract safer than hypoglycemic drugs that can trigger dangerously low readings.44
Summary

With aging, a sedentary life, and ingestion of sugars and starch, 
_after-meal_ insulin and glucose spikes can escalate to a chronic state of hyperinsulinemia, a risk for multiple age-related diseases including cancer.

Most individuals rely on a _fasting_ blood glucose test from annual physical exams, but high _after-meal_ insulin levels can be missed for many years.

When glucose abnormalities are finally detected, severe _insulin-driven_ damage has likely already occurred.

Human studies have validated two _plant_ extracts that can _reverse_ this trend.

_Maqui-berry extract_ has been shown to slash after-meal insulin up to 56%, glucose by 15%, and HbA1c by 0.3% (from 5.65% to 5.35%).

And _clove extract_ reverses after-meal glucose surges within two hours.

Inasmuch as excess _insulin_ and _glucose_ levels promote disease and accelerate aging, these two _plant extracts_ provide powerful support for a healthy longevity program.

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

References

8. Goldstein BJ. Insulin resistance as the core defect in type 2 diabetes mellitus. _Am J Cardiol._ 2002;90(5a):3g-10g.


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References

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Atherosclerosis (or hardening of the arteries) can affect any artery in the body. It is a leading cause of heart disease and stroke.\textsuperscript{1,2}

Scientists have identified an overlooked risk factor for atherosclerosis that rivals high cholesterol—\textit{arterial stiffening}.\textsuperscript{3,4}

Arterial stiffening is more than just plaque formation associated with occluded arteries. \textbf{Stiffening} damages fragile capillaries that nourish our organs. This loss of youthful suppleness prevents our arteries from properly regulating blood flow and pressure.\textsuperscript{3}

In addition to causing high blood pressure, arterial stiffening can lead to \textit{organ damage},\textsuperscript{5} which we recognize as heart attacks, strokes, cognitive decline, dementia, kidney failure, and a host of other disorders.

Combatting loss of arterial flexibility can be as simple as incorporating two nutrients into your daily regimen.

Studies show that \textbf{vitamin D} and \textbf{vitamin K} play an essential role in slowing—and even preventing—\textit{arterial stiffening}.\textsuperscript{6-8}

In this article, we’ll examine how these two nutrients work together to reduce \textit{arterial stiffening}, and ultimately, the degenerative disorders associated with it.
Increasingly, researchers are focusing on the lifestyle and nutritional factors that contribute to arterial stiffening—and, importantly, to its prevention.14,24,25 Two key nutrients—vitamin D and vitamin K—have shown compelling promise in this area. Both play critical roles in helping our bodies to manage calcium, which makes them essential for preventing dangerous arterial stiffening.

Putting Calcium in its Place

Nutritionists used to think of vitamin D as the calcium-and-bone vitamin, and vitamin K as the blood-clotting vitamin. More current scientific evidence suggests that both vitamins play important roles in helping our bodies properly manage calcium.

Both vitamin D and vitamin K play a crucial role in calcium metabolism. Vitamin D promotes calcium absorption from the diet while also promoting calcium deposition in bones. In this way, it helps with the continuous remodeling of bone that helps keep our skeletons strong and adaptable.

Vitamin K, on the other hand, is essential for keeping calcium out of your arteries. This is because vitamin K modifies specific proteins in arterial walls, making them resistant to binding to calcium. This process prevents arterial calcification and stiffening.

In addition to keeping calcium out of your arteries, vitamin K promotes the proper deposition of calcium into bone, and vitamin K has been promoted recently as a way to prevent osteoporosis.26

Causes of Arterial Stiffening

Studies show that aging alone, as well as conditions such as type II diabetes, contribute to a steady rise in arterial stiffness. These conditions can result in high blood pressure and damage to organs throughout the body.18,20,22

One of the main contributors to arterial stiffening is calcification. This occurs when calcium from the blood is deposited into the normally supple arterial walls, leading to literal hardening of the arteries.10,23

The Dangers of Arterial Stiffness

Healthy arteries consist of multilayered walls capable of constricting (narrowing) or dilating (widening) in response to the needs of the tissues they supply.

For years, scientists have studied the artery’s innermost layer, or endothelium, in an attempt to understand atherosclerosis and cardiovascular disease. They now know the damaging roles of blood sugar, inflammation, and an array of signaling molecules in disrupting blood flow.9

New data show that in addition to the endothelium, the middle, muscular layer of arteries is also closely involved in the blood-flow abnormalities that produce not only cardiovascular disease and hypertension, but a host of other age-related disorders.8,10,11

In fact, arterial stiffness has now been identified as a contributing factor to:12-16

- Hypertension
- Heart attack
- Stroke
- Kidney disorders (including end-stage renal disease)
- Liver disorders (especially non-alcoholic fatty liver disease, or NAFLD)
- Type II diabetes
- Cognitive decline
- Cerebral white matter disease (leukoaraiosis)
- Neurodegenerative disorders (e.g., Alzheimer’s, Parkinson’s)

Arterial stiffness is also emerging as a powerful predictor of death risk in an increasing number of clinical age-related conditions.17,18

The main immediate consequence of arterial stiffening is a steady rise in blood pressure, which contributes to destructive changes that further stiffen arteries—creating a vicious cycle.15,18,19

Increasingly, researchers are focusing on the lifestyle and nutritional factors that contribute to arterial stiffening—and, importantly, to its prevention.14,24,25 Two key nutrients—vitamin D and vitamin K—have shown compelling promise in this area. Both play critical roles in helping our bodies to manage calcium, which makes them essential for preventing dangerous arterial stiffening.
It is becoming increasingly clear that we need both vitamins D and K to get our dietary calcium into bones, where it belongs, and to keep it out of arteries, where it doesn’t.

Vitamins D and K can work individually and together to keep our arteries young and supple—and to prevent the myriad disorders associated with arterial stiffening.

**Vitamin D: Contributor to Arterial Suppleness**

Scientists have known for years that vitamin D is essential for proper calcium absorption from the diet. Now they are beginning to recognize its role in arterial health as well.

New evidence suggests that insufficient vitamin D accelerates cardiovascular diseases and may contribute to arterial stiffening. Similarly, low vitamin D levels are associated with high blood pressure, a major manifestation of arterial stiffening.30,31

Unfortunately, vitamin D deficiency is all too common—a problem that may be behind arterial stiffening as well as other health problems.32,33

Two studies have demonstrated that vitamin D supplementation is an important approach to preventing or alleviating cardiovascular disease, particularly in certain high-risk groups such as diabetics, older adults, and people with deficiencies in dietary vitamin D intake or insufficient sunlight exposure.33,34

This approach has now been validated in multiple trials studying at-risk patients.
Clinical Trials Show Dramatic Improvements

In a study of middle-aged type II diabetics, subjects received either a placebo or 1,000 IU of vitamin D daily. After one year, supplemented patients had a decrease in their measure of arterial stiffness known as the central aortic augmentation index. There was no improvement in the placebo group.

Another study examined adults with elevated blood pressure who were vitamin D deficient. After taking 4,000 IU of oral vitamin D3 daily for 6 months, they experienced a 12.3% reduction in arterial stiffness (as measured by augmentation index). No changes were shown in a control group receiving 400 IU/day (the standard “recommended” dose).

A Danish study conducted in winter months demonstrated that 3,000 IU of vitamin D3 reduced both systolic (top number) and diastolic (bottom number) blood pressure in subjects who were vitamin D insufficient (<32 ng/mL). Numerous subsequent studies have confirmed vitamin D’s arterial stiffness-reducing effects in both healthy and high-risk populations.

The preponderance of evidence shows vitamin D to be a critical factor in preventing the many disorders associated with arterial stiffening—especially those involving standard risk factors such as hypertension.

Next, we turn our attention to vitamin K, the other crucial factor in maintaining healthy arterial function well into advanced years.

Understanding Vitamin K

Vitamin K1. Vitamin K1, also known as phylloquinone, is found in plants. Some of it converts to vitamin K2 in the body. Published studies show disease risk reduction in response to ingestion of vitamin K1.

Vitamin K2 (MK-4). MK-4 is found in meat, eggs, and dairy products. It is the most studied form of vitamin K to preserve bone health. It is rapidly absorbed and rapidly metabolized by the body.

Vitamin K2 (MK-7). MK-7 is found in fermented soybeans and fermented cheeses. What makes this form so special is that it remains active in the body for more than 24 hours. This is critical when protecting against calcification since matrix Gla-proteins quickly inactivate in the absence of vitamin K2.

There may be benefits to taking all three forms of vitamin K in a single supplement.

Life Extension® Recommendations

For maximum coverage, Life Extension recommends a combination supplement that provides 1,500 mcg of vitamin K1, 1,000 mcg of vitamin K2 (MK-4), and 100 mcg of vitamin K2 (all-trans MK-7). All-trans is a new form of MK-7 that is 100% bioactive.

For vitamin D, the typical dose range is 3,000 IU to 8,000 IU of vitamin D3 daily taken with a meal for better absorption.

Annual blood tests can enable one to know if they are taking the proper dose of vitamin D they need to achieve optimal levels of 25-hydroxyvitamin D.

A Danish study conducted in winter months demonstrated that 3,000 IU of vitamin D3 reduced both systolic (top number) and diastolic (bottom number) blood pressure in subjects who were vitamin D insufficient (<32 ng/mL).

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Next, we turn our attention to vitamin K, the other crucial factor in maintaining healthy arterial function well into advanced years.

Teflon for your Arteries

Vitamin K plays an important role in arterial health because of its role in managing calcium. Vitamin K is required for the activation of a biomolecule called matrix Gla-protein, which inhibits calcium from being deposited in artery walls. Think of it like Teflon for your arteries.

Without sufficient vitamin K, matrix Gla-protein fails to become activated, resulting in calcium deposition and increased arterial stiffness.

Many of us don’t get vitamin K in our diets, particularly if we consume processed foods, which are nearly devoid of the vitamin. Not surprisingly, then, studies of people who have insufficient vitamin K intake reveal increased markers of arterial stiffness, especially in older adults.

These factors put anyone without ample vitamin K intake at increased risk for arterial stiffening, particularly groups already at high cardiovascular risk, such as diabetics.

The good news is that studies in both animals and humans clearly show that supplementing with vitamin K helps prevent or reduce arterial stiffness.
Benefits of Vitamin K

In a laboratory study, diabetic rats were shown to have reductions in activated matrix Gla-protein of 36%, compared with nondiabetic controls. This led to increases in major artery calcium deposits of up to 56%, and ultimately produced a 44% increase in arterial stiffness.23

A recent human randomized controlled clinical trial illustrated the value of oral vitamin K supplementation, using a form of vitamin K2 called menaquinone-7, or MK-7.39 The study involved 244 healthy, postmenopausal women, a group whose risk for cardiovascular disease approaches that of men. Half received placebo, and the other half received vitamin K2 in the form of MK-7.39

This three-year study showed that supplementation with MK-7 significantly reduced (by 50%) levels of inactive matrix Gla-protein, indicating vitamin K’s protective effect on cardiovascular health.39 The results from this study showed the vitamin K (MK-7)-supplemented women had significant reductions in arterial stiffness.

As an added benefit, those with the highest stiffness at baseline experienced significant improvements in a host of other arterial health parameters related to arterial suppleness as well. Taken together, this combination of animal and human data strongly indicates the need for ample vitamin K supplementation for all of us who are at risk for arterial stiffening and the resulting hypertension, cardiovascular disease, and premature death.

How Arterial Stiffness Accelerates Aging

The term “arterial stiffness” refers to an abnormal stiffening in the walls of large arteries leading from the heart to major organs. In healthy young people, those large arteries remain elastic, while more distant, smaller arteries are stiffer.17

This has the effect of “dampening” the large pressure waves produced with each heartbeat, which allows blood to flow smoothly, without big fluctuations in pressure, through the vital capillary beds that nourish all of our tissues.17

The lack of major pulsations in capillaries protects them from pressure-induced damage, allowing for normal exchange of oxygen, carbon dioxide, nutrients, and waste products.

But with aging, and under constant attack by blood sugar, inflammation, and other factors, those central arteries begin to stiffen. The result of that stiffening is a loss of the pressure damping effect, leading to highly pulsatile pressure waves reaching the delicate capillary beds, which in turn induces physical stresses on capillaries, and disrupts their normal function.17,56,57

Furthermore, arterial stiffening leads to elevated blood pressure, which itself is a major cause of further stiffening, leading to a vicious cycle of aging, hypertension, arterial stiffening, and even worse hypertension.18,56

The end result is damage of the organs supplied by those capillaries, which we recognize as heart attacks, strokes, brain changes leading to cognitive decline and dementia, liver disease, kidney failure, and a host of other disorders related to atherosclerosis, aging, or both.

Preventing arterial stiffening, then, is an essential step in preventing virtually all age-related organ failures and related disorders.
**Summary**

*Arterial stiffening* is a major contributor to cardiovascular disease risk. It occurs when arteries lose their youthful suppleness, leaving us with narrowed arteries incapable of regulating blood flow and pressure, and in turn damaging the fragile capillary beds that nourish our organs.

One of the main underlying causes of arterial stiffening is a buildup of calcium in the arteries.

Vitamins D and K are intimately involved in how our bodies manage calcium—specifically keeping it in our bones, and out of our arteries. This makes these vitamins essential for preventing arterial stiffening.

Vitamin D3 (cholecalciferol) and vitamin K2 have been shown in human clinical trials to significantly reduce arterial stiffness, thereby reducing one of the most dangerous risk factors for heart disease, stroke, neurodegenerative diseases, and a variety of other so-called “age-related” disorders.

The important role vitamins D and K play in preventing arterial stiffening make it critical for all older adults to get sufficient intakes of these important vitamins—both of which are lacking in even healthy diets.

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**References**


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**Warning to Coumadin® (warfarin) Drug Users:** Patients prescribed vitamin K-antagonist anticoagulant prescription drugs like warfarin should consult their physician before taking vitamin K supplements like Super K and Once-Daily Health Booster. There is evidence, however, that users of drugs like warfarin could benefit from a consistent low dose of supplemental K. Ask your doctor if you can take a low dose (45 mcg a day) of vitamin K2 in the long-acting MK-7 form for the purpose of stabilizing your INR levels and also protecting your body against long-term vitamin K deficit. Do not initiate any form of vitamin K supplementation without full cooperation of your treating doctor, as your doctor may need to increase your dose of warfarin to compensate for your vitamin K supplement. Life Extension® provides several forms of low-dose vitamin K for physician consideration.

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Around-the-Clock Blood-Pressure Control

On November 13, 2017, 30 million Americans who previously thought their blood pressure was in a safe range suddenly became clinically hypertensive.¹

On that day, the American Heart Association and the American College of Cardiology changed the definition of hypertension, lowering it from 140/90 mmHg down to 130/80 mmHg.²³ They also redefined “elevated blood pressure” as anything over 120/80.

These new guidelines vindicate Life Extension’s long-time stance that ideal systolic blood pressure should be below 120 mmHg—and closer to 115 mmHg for most people.

In addition to being lower, blood-pressure control needs to occur around the clock to avoid the dangers of artery-damaging spikes.

In healthy individuals, blood pressure tends to dip at night. But if you’re one of the individuals whose blood pressure does not dip at night—as it should—that means unnecessary damage is occurring to your blood vessels and organs.⁴

The exciting news is that researchers have identified several nutritional compounds that not only help lower blood pressure but also keep it down at night, for around-the-clock protection.

These nutritional approaches can be added to existing blood pressure-control programs, or used alone, to achieve improved benefits in conjunction with physician supervision.
In addition to increasing the risk of cardiac events, high blood pressure contributes to other conditions including retinopathy, kidney failure, vascular dementia, and diabetes.\(^5\)\(^,\)\(^8\)

In the kidneys, the ability to filter the body’s waste products and separate excess fluid from the blood weakens.\(^7\)

In the brain, the relentless pounding damages delicate capillary beds leading to reduced cerebral perfusion (blood flow). Higher-than-optimal blood pressure can lead to multi-infarct dementia that arises from many mini-strokes.

Women who develop high blood pressure in their 40s are \(73\%\) more likely to develop dementia than women who maintain healthy blood pressure.\(^9\)

### Nighttime Dangers

Some people with high blood pressure face an **extra** risk at night.

Daily variations in blood-pressure patterns are tremendously important, especially in older adults.\(^10\),\(^11\) Blood pressure **dips** somewhat at night, providing temporary relief from the pounding damage.\(^4\)

But in about \(35\%\) of adults with hypertension, their blood pressure does not fall at night. In these “**non-dippers,**” the damage may continue around the clock,\(^4\) exposing these individuals to a significantly higher risk of cardiovascular disease and death compared to “normal dippers”—**even when both have the same blood pressure during the day.**\(^4\)

For these individuals, preventing high blood pressure—or aggressively treating it at an early stage—is even more important for preventing the relentless damage.

### Blood-Pressure Basics

When it comes to lowering blood pressure, **at-home monitoring** is essential to ensure that optimal **24-hour** protection is achieved. The availability of low-cost and reliable at-home **blood-pressure monitors** makes this easy.

Lifestyle changes such as losing weight and increasing cardiovascular fitness through exercise can help support healthy blood-pressure levels.

The older drug classes of medication often have side effects that patients find frustrating and bothersome. Side effects can include nighttime urinary frequency with the use of diuretics, or cold hands/feet and sexual dysfunction with the use of beta-blockers.

Newer classes of antihypertensive drugs like **angiotensin II receptor blockers** are usually better tolerated by patients in comparison with older medications like diuretics and beta-blockers.
Some people may only need to take one angiotensin II receptor blocker like telmisartan (40 mg to 80 mg a day) to achieve good results. This drug has additional benefits for vascular health.12,17

For others, the best strategy for hypertension control is the use of low doses of several different classes (different mechanisms of action) of medications.

**Solutions for High Blood Pressure**

Despite billions of dollars spent on drugs to lower blood pressure,18 the condition continues to threaten millions of Americans each year. Statistics show that about a quarter of those with hypertension cannot reduce their readings even when taking three different blood-pressure medications.19

For many people, blood-pressure drugs can have uncomfortable—and sometimes dangerous—side effects.

Several nutritional compounds have been found to help reduce blood pressure both day and night. They work in ways similar to many prescription drugs—but without the side effects.

These compounds represent a novel approach to promoting healthy blood pressure and can provide critical around-the-clock management. For many people, this may provide an adequate maintenance program in consultation with their physician.

**Angiotensin-Blocking Flavonoids**

Three natural compounds have been found to help block the receptor for angiotensin II,20 which is a hormone that triggers the constriction (narrowing) of arteries.21 These flavonoid molecules—quercetin, myricitrin, and myricetin—are found in a wide variety of plant foods, but only in small amounts.22,23

Much like a finger over a garden hose, the narrowing of arteries raises pressure within them. Thus, blocking the angiotensin receptors is an effective way of bringing down blood pressure by helping to relax the arteries.

Experimental studies using assessment of receptor docking (i.e. the ability of a molecule to bind to a receptor) suggest that both quercetin and myricetin are effective at blocking angiotensin II receptors.20

A study conducted on rats showed that myricetin reduced systolic blood pressure by inhibiting the arterial-contracting response to angiotensin by 43%.24

These encouraging results led scientists to study the blood pressure-lowering effects of these flavonoid nutrients in placebo-controlled clinical trials—and the results did not disappoint.
**Human Studies**

Studies in adults showed that flavonoids like quercetin are effective at lowering blood pressure in healthy adults, in those with elevated blood pressure and hypertension (according to new guidelines), and in those with type II diabetes.

In both healthy adults and in those who were overweight or obese, 150 mg a day of quercetin reduced systolic blood pressure compared to placebo. In adults with elevated blood pressure and hypertension (according to new guidelines), 162 mg of quercetin daily reduced systolic blood pressure by 3.9 mmHg compared to a placebo.

Higher amounts—730 mg of quercetin daily—reduced systolic blood pressure by 7 mmHg and diastolic blood pressure by 5 mmHg.

**Calcium Channel-Blocking Stevioside**

When intracellular calcium levels rise in smooth-muscle cells, it causes those cells to contract, which narrows arteries and increases blood pressure. Thus, blocking calcium channels is a distinct—and extremely effective—means of reducing blood pressure.

Scientists have found that a plant extract called stevioside mimics the activity of calcium channel-blocking drugs, effectively blocking calcium channels in the smooth-muscle cells of the arteries.

Stevioside is derived from the leaves of Stevia rebaudiana that is often used in no-calorie sweeteners. A 2017 review found that stevia glycosides provide therapeutic effects against diseases such as cancer, diabetes mellitus, obesity, inflammation—and hypertension—without any toxicity.

Calcium channel-blocking medications work well in combination with angiotensin II receptor-blocking medications. In the same way, stevioside can work well in combination with calcium channel-blocking medications.

**Blood-Pressure Recommendations**

For most aging individuals, Life Extension recommends an optimal blood-pressure goal of 115/75 mmHg.

However, those aging individuals with long-standing hypertension and/or coronary artery disease, individuals with kidney disease, and those over 80 years of age should be aware that a rapid, overly-aggressive reduction of blood pressure should be avoided. Signs of overly aggressive blood-pressure reduction may include worsening cognitive function, dizziness and/or lightheadedness when standing quickly from a sitting position, and worsening biomarkers of kidney function.

Regrettably, some older, fragile patients may simply not tolerate a target blood pressure of 115/75 mm Hg due to long-standing damage to the vascular system, thus requiring a higher perfusion pressure to meet physiologic demands. In these fragile patients, maintaining the lowest blood pressure tolerated is reasonable.

Life Extension recommends frequent blood testing of kidney function biomarkers like BUN and creatinine when embarking on an aggressive blood pressure control program. Also, Life Extension strongly recommends that all people purchase a low-cost, at-home blood-pressure monitor so they can check themselves when trying new medications or nutrients.
slashed systolic readings by an average 6.1 mmHg and diastolic readings by 3.5 mmHg.43

Melatonin’s effects are so substantial that the author of a recent study concluded that, “[S]upplementation of melatonin…has been shown to be efficient in…the control of hypertension and metabolic syndrome.”44

As an added benefit, melatonin has also been shown to protect various organs from long-term hypertension.45-47

with the flavonoids quercetin, myricitrin, and myricetin to deliver a similar dual mechanism of action.

A recent meta-analysis included data on 788 patients taking between 750 mg and 1,500 mg of stevioside a day. Across all studies, stevioside demonstrated a 4.5 mmHg decrease in systolic blood pressure. And when stevioside was continued for a year or more, the mean decrease in systolic blood pressure was a substantial 11.9 mmHg.137

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Around-the-Clock Protection With Melatonin

The hormone melatonin has numerous mechanisms of action that help lower blood pressure.

It dilates blood vessels38 and inhibits “fight-or-flight” signals from the sympathetic nervous system.38,39 It also helps regulate mitochondria—the energy-producing structures inside cells—to maintain a cardiovascular function.40 But what makes melatonin especially noteworthy is its impact on nighttime blood pressure.

Studies have shown that melatonin helps regulate circadian rhythms and reduces nighttime blood pressure.41-43 This is important for everyone with hypertension—but it is especially important for the 35% of non-dippers.

Not all types of melatonin have equally effective blood-pressure benefits. A meta-analysis compared 5 mg daily of immediate-release melatonin with 2-3 mg daily of controlled-release melatonin.

While immediate-release melatonin eked-out insignificant reductions of 0.3 mmHg systolic and 0.2 mmHg diastolic, the controlled-release melatonin slashed systolic readings by an average 6.1 mmHg and diastolic readings by 3.5 mmHg.43

Melatonin’s effects are so substantial that the author of a recent study concluded that, “[S]upplementation of melatonin…has been shown to be efficient in…the control of hypertension and metabolic syndrome.”44

As an added benefit, melatonin has also been shown to protect various organs from long-term hypertension.45-47

Consequences of High Blood Pressure

Hypertension has long been known as the “silent killer.” It produces no symptoms at all in the majority of victims, while causing severe and often irreversible damage to blood vessels and the major organs they serve.

Whether high blood pressure is prolonged or periodic, it inflicts progressively lethal damage to multiple organs and physiological (normal biological) systems. The following is a list of conditions associated with high blood pressure:7-9

- Endothelial dysfunction
- Generalized atherosclerosis
- Aneurysm
- Bone loss
- Stroke
- TIA (transient ischemic attack)
- Intracerebral hemorrhage
- Hypertensive encephalopathy (brain dysfunction)
- Pulmonary edema (fluid in the lungs)
- Retinopathy
- Dementia and vascular dementia
- Mild cognitive impairment
- Atrial fibrillation (irregular heartbeat)
- Heart attack
- Coronary artery disease
- Heart failure
- Left ventricular hypertrophy (enlarged left heart)
- Kidney failure
Summary

Life Extension has long maintained that the blood-pressure readings called normal by national guidelines were in fact much too high, lulling millions of people into a false sense of security while they are experiencing body-wide dangers.

New official guidelines have finally validated Life Extension’s longstanding blood-pressure recommendations.

High blood pressure elevates the risk of disorders ranging from kidney disease to dementia because of the severe damage it does to blood vessels and the organs they serve.

A unique combination of five nutrients—quercetin, myricitrin, myricetin, stevioside, and melatonin—can work by multiple mechanisms to control blood pressure around the clock.

No one should ever assume a drug, supplement, or healthy lifestyle regimen is producing optimal blood pressure readings.

Use of an at-home blood-pressure monitor can enable people to better achieve 24-hour blood-pressure control.

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

References


(References continue on page 66.)
Many physicians recommend that patients check their blood pressure at home on a regular basis.

You can do so with the easy-to-use AccuFit™ Plus Cuff Multi-User Blood Pressure Monitor. It provides:

- A customizable cuff to fit any size arm (8.6 to 16.5-inch circumferences)
- Irregular heartbeat detection (IHB)
- Data storage for up to four family members (60 results each)
- Easy-to-retrieve results for reporting to your physician
- Clinical accuracy

AccuFit™ Plus Cuff Multi-User Blood Pressure Monitor
Item# 70000 • Medium/large cuff

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For full product description and to order AccuFit™ Plus Cuff Multi-User Blood Pressure Monitor, call 1-800-544-4440 or visit www.LifeExtension.com
around-the-clock blood-pressure control


Gastro-Ease™ contains a unique nutrient compound (zinc-L-carnosine) to help soothe the stomach lining while providing a beneficial bacteria (*Lactobacillus reuteri*) for optimal gastric health.

Suggested dose is one capsule twice daily, after breakfast and before bed.

**Gastro-Ease™**
Item #02100 • 60 vegetarian capsules

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Cardiometabolic International Summit

July 7-14, 2018

Cardiovascular disease remains the leading cause of death for men and women worldwide. This conference highlights the recent advances in the treatment and prevention of coronary heart disease, stroke, and metabolic disorders such as insulin resistance and diabetes.

FEATURED:

Michael Ozner, MD, FACC, FAHA
COURSE DIRECTOR

Medical Director, Center for Prevention and Wellness, Baptist Health South Florida • Voluntary Assistant Professor of Medicine (Cardiology), University of Miami Miller School of Medicine
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Triple Action Blood Pressure AM/PM is formulated with myricetin, myrilitrin, and quercetin flavonoids along with steviosides to support a healthy 24-hour blood pressure cycle.

Suggested dose is one tablet in the morning and one tablet 30-60 minutes before bedtime. This formula is available with or without (2 mg) melatonin.

Also available, Dual Action Blood Pressure Support (without melatonin). Item# 02025.

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www.LifeExtension.com

CAUTION: Consult your healthcare provider before use if you are taking medication or are being treated for a medical condition. Do not use if under the age of 18, pregnant, lactating, or trying to become pregnant. After taking the PM tablet, do not attempt to drive or operate heavy machinery and use caution if combining with alcohol. This product is not intended to replace anti-hypertensive medications your doctor may have prescribed.

These statements have not been evaluated by the Food and Drug Administration. These products are not intended to diagnose, treat, cure, or prevent any disease.
In 2015, Will Smith starred in the major motion-picture *Concussion.*

In it, he played Bennet Omalu, M.D., a pathologist who fought to expose the extreme and potentially life-threatening dangers of a severe form of **brain injury** called *chronic traumatic encephalopathy* (CTE).

The movie was based on the true story of this medical hero who took on the National Football League and the medical establishment, which sought to discredit Dr. Omalu’s findings and destroy his career.

Dr. Omalu’s work eventually forced the NFL to implement changes aimed at helping protect players from long-term brain damage.

But there’s more to this story.

While the toll among professional athletes is bad enough, it’s **dwarfed** by the burden that **millions** of nonprofessional athletes—especially children and adolescents—will carry for the rest of their lives after suffering sports-related head injuries.

Even mild TBIs can cause headaches, fatigue, dizziness, sleep problems, and mood disorders.¹ It can also cause serious psychiatric disorders like depression, aggression, and increased risk of suicide.²

Despite the dangers—and the prevalence—mainstream medicine doesn’t know much about the condition, and certainly doesn’t have any ways to effectively treat it.

Fortunately, a number of innovative doctors are working to revolutionize the treatment of traumatic brain injury.

The NFL and Traumatic Brain Injury

In 2005, the prestigious journal *Neurosurgery* published Dr. Bennet Omalu’s blockbuster report detailing his findings from the autopsy of Mike Webster.³ This former player for the Pittsburgh Steelers died suddenly at age 50 in 2002 after struggling for years with progressive neurological symptoms.

After conducting the autopsy, Dr. Omalu concluded that Mike Webster suffered from a neurodegenerative disease as a result of repeated blows to the head. This condition, chronic traumatic encephalopathy, or CTE, is characterized by the accumulation of tau proteins in the brain, similar to Alzheimer’s disease.⁴

In his conclusion, Dr. Omalu wrote, “This case highlights potential long-term neurodegenerative outcomes in retired professional National Football League players subjected to repeated mild traumatic brain injury.”³

The backlash against Dr. Omalu was intense and instant. Worried about protecting its profits, the NFL immediately launched an organized and well-funded campaign to destroy him. First, the league pushed for retraction of his paper.

“To get a retraction, you need to successfully prove the researcher engaged in fraudulent behavior and generated false data,” Dr. Omalu said. “They were pretty much labeling me a criminal.”

To help bolster its case, Dr. Omalu said the NFL made a substantial grant to Boston University to fund research that would discredit him. At the same time, the medical establishment mobilized against Dr. Omalu and his research.

“They knew what they were doing,” he said. “If they had succeeded, that would have been the end of me. I would have lost my license and my career would be over. But I defended myself and presented my data to a committee at the journal. A ruling was made that I had done nothing wrong.”

Unfortunately for Dr. Omalu, his trials weren’t over yet. Once his findings had been accepted and CTE described as a legitimate issue, the medical establishment launched a furious assault against him to discredit him personally and professionally. He was ostracized at every level of his profession, denied funding to continue his research, and he avoided conferences for fear of professional retaliation.

“I had to spend my own money because nobody would give me any to fund my research,” he said. “They even enlisted the National Institutes of Health. Usually if someone introduces something new, the NIH will invite them to talk and see what they need. That didn’t happen with me.”

In fact, the narrative was “being rewritten” as the truth of his findings gained traction, and Dr. Omalu found himself being written out of the story.

“I was very confused,” he said. “Why would they want to remove me? Other doctors were going around saying they were the first to publish this. In 2016, the NIH said it was the first to establish a diagnostic criteria for CTE. What about me? It was very difficult. I struggled with depression and contemplated suicide.”
His enemies in the NFL and medical establishment stooped to the worst kind of smear campaign, he said. “They used xenophobia against me because I’m a black guy and a foreigner,” he said. “I wasn’t a big name. I didn’t have a big lab. I was working from my apartment and paying for my own research. But I believed the truth would prevail. It just took a foreigner from Nigeria to prove this was happening in America’s biggest sport.”

Ultimately, Dr. Omalu took his story to Hollywood, the only institution in American he thought was powerful enough to get the truth out about CTE and his story. “Will Smith didn’t want to do the movie at first,” he said. “But he did it to make the truth known. I’m deeply grateful to Hollywood, but it’s still affecting me. I’m still being marginalized.”

In 2016, Boston University rescinded its plans to give Dr. Omalu the prestigious Beyond Health Award. The school’s reason? An interview Dr. Omalu gave in which he cited a potential conflict of interest at the school’s Concussion Legacy Foundation and World Wrestling Entertainment, Inc., which is also struggling with the CTE question thanks to Dr. Omalu’s pioneering work.

What You Need to Know

The Epidemic of Traumatic Brain Injury

• Thanks in large part to the efforts of Dr. Bennet Omalu, unwarranted neglect of the epidemic of severe brain injuries has finally received recognition and wide exposure in the media.

• Traumatic brain injury (TBI) and chronic traumatic encephalopathy (CTE), related to both professional and amateur sports players, is now being more frequently diagnosed, but medical understanding of the mechanisms involved in these injuries is lacking. Experts believe this lack of understanding has likely led to millions of undiagnosed cases and sufferers who therefore don’t receive the treatment they need.

• TBI symptoms include fatigue, dizziness, sleep disorders, headaches, and mood disturbances. Changes in personality are sometimes observed, as well as behavioral and cognitive difficulties. Compared to the general population, patients with chronic traumatic encephalopathy are much more likely to commit suicide.

• Innovative treatments are being developed to help relieve the effects of chronic traumatic encephalopathy. These include the use of certain nutrients and hormone replacement therapy.
But the risk is especially great for children and adolescents involved in sports.

A survey published in the journal *Pediatrics* estimated that 1.1 to 1.9 million children and adolescents under the age of 18 sustain a sports-related concussion every year.9 And according to the American Association of Neurological Surgeons (AANS), sports-related injuries contribute to about 21% of all TBIs reported in American children and adolescents.10

In fact, TBI is the leading cause of sports-related fatality.10

As far back as 1957, the American Academy of Pediatrics issued a position paper warning that children should not engage in football, boxing, or wrestling out of a fear of head injury.11 Almost 20 years later, the *Lancet* published an editorial saying it was “foolhardy” for people to engage in sports that have a risk of brain trauma.12

And now, with Dr. Omalu’s new book, *Truth Doesn’t Have a Side*, he is sounding the alarm once again.

“I don’t think any child under 18 should play a high-impact, high-contact sport,” he told *Life Extension*. “That includes football, rugby, boxing, hockey, mixed-martial arts, and wrestling. The most important part of your life is your intellect, your intuition. If a game is meant to uplift your state of well-being, but actually robs you of your well-being, that is not a game. That is not a sport.”

Many people might not realize that you don’t have to suffer from a concussion to experience a traumatic brain injury.10

“Concussion is a disease caused by TBI. The more important issue is subconcussive, repetitive injury. Every blow to the head causes brain injury. Every blow.”

The bottom line, according to Dr. Omalu, is that there is no safe level of head trauma.

Why Children are More at Risk

While the link between chronic traumatic encephalopathy and professional football is new, the connection between sports and brain injury has been known for decades.7 We are all familiar with famous boxer Muhammad Ali, who was diagnosed with Parkinson’s disease in 1984 and publicly struggled with it for the rest of his life.8

But the risk is especially great for children and adolescents involved in sports.

The Search for Answers

Despite intense research into better understanding the neurobiological effects of mild TBI and concussion, there is no approved biomarker test used to diagnose it—and no consensus about exactly how mild TBI causes the long-term brain damage and cognitive deficits seen in so many soldiers and athletes.13 This lack of agreement makes identification and treatment exponentially more difficult.

Most TBI cases are never reported, and few people get medical attention. Those who do are typically seen on an outpatient basis.9

Clearly, something has to change.
If there is a silver lining, it’s that the increased focus on sports-related head trauma has spurred interest in novel approaches to limit the damage and help victims recover. There is no cure for CTE, but for the first time, innovative doctors are raising the hope of at least containing the damage.

**Hormones and Brain Injury**

While mainstream medicine continues to struggle just to understand chronic traumatic encephalopathy, a number of physicians are looking to revolutionize treatment of traumatic brain injury.

Their focus is on hormone replacement therapy. The National Institutes of Health database has dozens of studies showing the interaction between hormone status and TBI, yet virtually no mainstream doctors are using hormone therapy to address long-term damage caused by repeated TBI.

For example, there is a well-documented connection between reduced pituitary function and mild TBI. Specifically, studies have found hypopituitarism in 16% to 68% of patients. The more severe the injury, the worse the damage.

The pituitary gland is responsible for producing critical hormones, including growth hormone and thyroid-stimulating hormone (TSH), as well as stimulating the production of sex hormones such estrogen and testosterone.

Because of the reduced pituitary function, patients with TBI often suffer from low growth-hormone levels and reduced production of gonadotropins (FSH and LH) and thyroid-stimulating hormone. This reduction in growth hormone has been linked to increased abdominal obesity and metabolic alterations that are observable years after the original injury.

Reductions in sex hormone levels after mild traumatic brain injury have been observed in mice. In adolescent animals, repeated mild traumatic brain injury has been linked to hypogonadism in adulthood, as well as delayed puberty and erectile dysfunction.

Research has shown that testosterone levels can be a good indicator of function in TBI patients.

An animal study showed that treatment with estrogen reduced delayed swelling in the brain and intracranial pressure. Estrogen has well-known neuroprotective and anti-inflammatory properties.

These discoveries have prompted innovative physicians to investigate treating the long-term effects of TBI with hormone-replacement therapy. Among these groundbreaking doctors is Dr. Mark L. Gordon, who understood the importance of reduced pituitary function in this context years ago while treating a young man exhibiting signs of sports-induced brain injury.

**Short- and Long-Term Impact of TBI**

A traumatic brain injury (TBI) is defined as an injury caused by brain trauma, whether it’s from a blow to the head or from a piercing injury. They are categorized as mild, moderate, or severe on the Glasgow Coma Scale.

Concussions are a type of mild traumatic brain injury that results in symptoms, usually temporary, that may include headaches and confusion. These can be caused by blows to the head such as in sports, falling, or accidents, or in the case of tens of thousands of soldiers in Iraq, exposure to blast waves from ordnance.

Symptoms of a mild traumatic brain injury may include brief loss of consciousness, headache, nausea, vomiting, and fatigue. Most victims begin to recover from the acute injury within 24 hours while others experience persistent symptoms. And while some symptoms may occur soon after the injury, others can first appear weeks later.

Unfortunately, this is only part of the picture. Once the acute phase ends, there is a chronic phase to the post-injury period that can last indefinitely. According to the American Academy of Family Physicians, up to 20% of people who suffer from mild traumatic brain injury will exhibit “persistent physical, cognitive, or behavioral symptoms” for years. These physical symptoms can include headaches, dizziness, nausea, and problems with coordination, sleep, vision, and hearing.

Traumatic brain injury has been linked to a grim litany of psychiatric disorders, including personality changes, anxiety, aggression, depression, increased risk of suicide, and psychosis.
Today, he treats soldiers and athletes at his clinic, Millennium Health Centers, and hormone replacement is a vital part of his protocol.

Dr. Gordon’s hormone-balancing approach relies on diligent testing, followed by physiological doses of vital hormones. The goal is to restore hormone levels to the middle of the optimal range, while carefully monitoring each patient for improvement. His results have earned him invitations to speak about hormone therapy at conferences on traumatic brain injury.

“For traumatic brain injury patients,” Dr. Gordon told Life Extension, “any proper diagnosis and treatment protocol should begin with baseline testing of testosterone, growth hormone, thyroid, cortisol, insulin, and vitamin D.”

Reversing Brain Damage in Former Football Players

In 2014, William Faloon wrote an article in Life Extension Magazine® titled Outwitting our Aging Brain. It described how aging people suffer diminished brain blood-flow and what can be done to correct it.

In the box below is an excerpt from the article that describes a study showing reversal of traumatic brain injury clinical measures in response to a six-month treatment using specific nutrients:

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The rationale behind using these nutrients was that they were individually shown to enhance blood flow, protect against free radicals, enhance brain-cell membrane structure, boost acetylcholine, enhance neuronal metabolic activity, and reduce chronic inflammatory markers.

After six months, the tests were repeated. There were statistically significant increases in scores of attention, memory, reasoning, information processing speed, and accuracy in these retired NFL players. The SPECT scan showed increased perfusion in areas throughout much of the brain. The researchers who conducted this trial concluded:

“This study demonstrates that cognitive and cerebral blood flow improvements are possible in this group with multiple interventions.”

Neurological trauma during football events accelerates brain aging. Life Extension members should be gratified to know that they have been taking most, if not all of the nutrients shown in this study to reverse brain damage in retired NFL players. This brain damage clearly linked hypoperfusion (reduced brain blood flow) with cognitive impairment.
Summary

There has been an explosion in the recognition and diagnosis of TBI and CTE in recent years, both in professional sports and among the general population. Despite this wave of new cases, our understanding of the underlying mechanisms of traumatic brain injury and CTE remains primitive. As a result, millions of cases are likely not diagnosed and people don’t receive proper treatment.

The effects of TBI can include headaches, fatigue, dizziness, sleep and mood disturbances, and cognitive, behavioral, and personality changes. The risk of suicide among people suffering from CTE caused by repeated mild TBIs is much higher than the normal population.

New research is helping us understand the link between TBI and disturbances in the endocrine system. Innovative doctors are using hormone replacement therapy, along with specific nutrients, to help reduce the effects of CTE and improve patients’ quality of life.

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

AN OVERLOOKED MEDICAL HERO

This article does not fully relay the persecution and threats to his personal safety that Dr. Bennet Omalu endured by a medical establishment that was bought off by the NFL.

This article also does not fully describe the brilliant and painstaking research Dr. Omalu conducted that resulted in significant risk to his medical license, employment and immigration status.

History is laden with pioneers who defied conventional authority to advance medical science, often at great personal risk.

Identical situations exist today where effective means to save human lives exist, but are suppressed by a labyrinth of state and federal regulations that delay their introduction.

Dr. Omalu Uncovers Further Wrongdoing

Dr. Bennet Omalu recently resigned from his position as chief medical examiner for San Joaquin County, California, due to what he sees as inappropriate police meddling in his work.

Dr. Omalu claims Sheriff-Coroner Steve Moore has “routinely” interfered with his investigations in an effort to protect police officers. He said the interference from the sheriff was so excessive that it nearly amounted to unlicensed medical practice.

In a statement given to the media, Dr. Omalu wrote that he had “observed long before this that the sheriff was using his political office as the coroner to influence the death investigation of persons who die while in custody or during arrest by the police.”

Dr. Omalu’s claims were backed up by his former assistant, forensic pathologist Dr. Susan Parson, who also resigned. Omalu and Parson have turned over detailed documents related to their allegations to county supervisors and the district attorney.

As one example of alleged misconduct, Dr. Omalu pointed to the case of a 26-year-old man who died after fighting with both police and civilians. Dr. Omalu ruled the death a homicide by blunt force trauma.

Afterward, he said, “The sheriff called me into his office and told me that he wanted to make it an accident since officers were involved. He said that I should amend my report and state that he died from the civilians and not the police officers.”

In addition to numerous other cases, Dr. Omalu also cited a case from 2007 in which a man died during his arrest. “Information was intentionally withheld from me by the sheriff in order to mislead me from determining the case to be a homicide,” he said. “The sheriff still went behind my back months later and changed the manner of death to an accident to minimize the seriousness of the case.”

The San Joaquin County Medical Society has called on authorities to conduct a full investigation. The group’s president, Dr. R. Grant Mellor, called the charges alarming and said, “Physician independence is paramount to avoid improper influence on the practice of medicine.”
Changing Football

When Dr. Bennet Omalu’s autopsy report of Mike Webster was released in 2005, he was met with opposition from the National Football League (NFL)—but the league couldn’t wish the issue away forever.

After years of denying the real-world trauma of players suffering from horrifying symptoms long after their playing days were over, the NFL finally admitted it had a concussion problem.

In late 2016, NFL Commissioner Roger Goodell announced the Play Smart Play Safe campaign, which included a $100 million pledge to study, prevent, and treat head injuries, the hiring of a Chief Medical Officer at the NFL, and increased focus on the league’s concussion protocol.

Football rule changes have been implemented in an effort to reduce blows to the head, but these will not eliminate the brain damage.

References


Humans don’t manufacture vitamin C internally, so it must be obtained through dietary sources or supplements.

Vitamin C is water soluble and needs to be constantly replenished.¹

Fortunately, a flavonoid known as dihydroquercetin functions as a vitamin C “supercharger” that helps maintain its concentration throughout the body.²,³

References
Maintain Better Memory Function

VINPOCETINE

A compound originally found in the leaf of the periwinkle plant, vinpocetine has been shown to support brain health and memory function as people age.

Among its many benefits, vinpocetine has been shown to:

• Provide support for age-related cognitive decline
• Support healthy blood flow inside the brain

For full product description and to order Vinpocetine, call 1-800-544-4440 or visit www.LifeExtension.com

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Item #01327 • 100 vegetarian tablets

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# Financial Report

**Coalition for Radical Life Extension - RAADFEST 2017**

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## Expenses

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## Net Income

<table>
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<tbody>
<tr>
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We live in an unprecedented era as it relates to our knowledge about the underlying causes of aging.

Headlines routinely report on billionaires who are funding projects aimed at significantly extending healthy lifespans.

We at the Life Extension Buyers Club applaud all efforts to turn aging into a relic of the past, as smallpox and polio were last century.

But the complexity of the causes of aging makes it unlikely that one person will discover an ultimate cure.

A better approach is to engage with a broad array of scientists, activists, organizations and interested individuals through open sharing of information and inspiration.

This is the premise behind the annual RAADfest that will be held this year on September 20 - 23, 2018 in San Diego, California.

Sponsored by Life Extension®, RAADfest stands for the Revolution Against Aging and Death.

What distinguishes RAADfest from any event on the planet is the focus on human age reversal, group collaboration, community building and personal involvement.

Unlike typical conferences where you get lost in the crowd and feel buried in technical jargon, RAADfest brings people and experts together in a friendly atmosphere of collaboration and motivation.

Register for RAADfest 2018 now!
Take advantage of advanced discount pricing by calling 1-480-345-6554 (24 hours) or log on to www.RAADFest.com
initiate practical rejuvenation approaches based on your individual needs.

The ultimate objective of RAADfest is to support systematic strategies to counteract all known pathologies involved in degenerative aging. Yes, this is an ambitious undertaking. But the science is so close that it is now realistic to speak in these terms.

Register for RAADfest 2018 now to take advantage of advanced discount pricing by calling 1-480-345-6554 (24 hours) or log on to www.RAADFest.com

I look forward to seeing you personally at RAADfest.

At RAADfest 2018 I expect to present results from clinical studies in which reversals of clinical measures and biomarkers of aging appear to have already occurred.

Clinical measurements evaluate blood pressure, glucose, lipids, and tissue/organ functions. When these improve, we suspect we are reducing degenerative disease risk and possibly inducing regenerative effects.

Biomarkers of aging may include telomere length, DNA methylation patterns and immune risk/inflammatory profiles. When these improve, it indicates we may be achieving reversals of aging itself.

Anecdotal feedback can help corroborate if improvements of clinical measures and aging biomarkers are translating into youthful vitality and wellbeing.

How to Register for RAADFest 2018

Most people delay registering and pay a fee of $647 to attend. If you register by March 15th, 2018, your cost is only $497.

As you can see from the financial report on the first page of this article, RAADfest is a nonprofit endeavor and the registration fees paid equate closely with the hard costs of putting on the event, including three free meals and direct access to marquee names in the life-extension sciences.

### RAADfest 2018—Practical Approaches to Age-reversal.

For the past 38 years, Life Extension has relentlessly introduced scientific methods aimed at systematically abolishing limitations imposed by degenerative aging.

Now, rather than merely slowing aging and protecting against degenerative illness, we’ve entered a new era of regenerative medicine. At RAADfest 2018 we expect to announce results from a wide range of interventions including:

<table>
<thead>
<tr>
<th>Intervention</th>
<th>Age-Reversal Mechanism</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dasatinib/Quercetin</td>
<td>Selective removal of senescent cells</td>
</tr>
<tr>
<td>NAD$^+$ infusion</td>
<td>Repair broken DNA/Re-energize cells</td>
</tr>
<tr>
<td>Young plasma/cord infusions</td>
<td>Restore pro-youth proteins/hormones</td>
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<tr>
<td>Stem cell exosomes</td>
<td>Cell regeneration/telomere lengthening</td>
</tr>
<tr>
<td>Rapamycin/metformin</td>
<td>Turn on autophagy/telomere renewal</td>
</tr>
<tr>
<td>GDF11</td>
<td>Restore this pro-youth hormone</td>
</tr>
<tr>
<td>Thymus regeneration</td>
<td>Partial reversal of immune senescence</td>
</tr>
<tr>
<td>Periodic fasting</td>
<td>Restore hematopoietic function/immunity</td>
</tr>
</tbody>
</table>

RAADfest is the first large-scale event where multiple methods to reverse human aging are presented by credentialed individuals.

It’s also important to note that many of these interventions are affordable. The news media has disseminated misleading reports that only the wealthy will be able to achieve indefinitely extended lifespans.

As you will learn, some of the interventions cost relatively little. Prices will likely plummet as more of the public realizes they can defy their hereditary longevity limitations.

### There Is No Time to Waste

Each day, over 5,000 Americans perish from a degenerative illness. Included in this carnage are longevity enthusiasts whose biological clock dwindled before regenerative interventions were initiated. Stated succinctly, time is running out for many of our longtime supporters (including me)!

For these reasons, RAADfest 2018 will focus on specific therapies now in human trials, and the opportunity to directly connect with researchers who have often self-experimented. There will be lots of group interactions, question-and-answer sessions, and other forms of communication that will enable you to
Findings from proof-of-concept studies will be announced that reveal reversal of aging factors in human study subjects, with the potential to do more very soon. The audience will be able to submit questions for the speakers and directly interact with speakers and like-minded individuals, all of which will provide an engaging and interactive experience throughout the event.

RAADfest is presented by the nonprofit Coalition for Radical Life Extension, directed by James Strole, whose purpose is to unite like-minded people in ways that will benefit all of humanity, including readers of Life Extension Magazine®.

If this were a profit-making business, registration would be over $1,200, especially when considering the healthy meals included in the package. The goal is to keep registration fees low so that as many people can afford to attend as possible.

As you can see from the financial report (on opening page of this article), RAADfest operates on a very lean budget in order to remain as accessible as possible to more people.

Register Now to Save $$$

If you register by March 15th, 2018, your cost to attend this year’s RAADfest is $497. (The price goes up considerably after this date.)

To register at this discount price call 1-480-345-6554 (24 hours) or log on to www.RAADfest.com

About the Coalition for Radical Life Extension

The nonprofit Coalition for Radical Life Extension consists of groups supporting healthy longevity including Aubrey de Grey’s SENS Research Foundation, People Unlimited Inc. led by James Strole and Bernadeane, Dave Kekich’s Maximum Life Foundation, Liz Parrish’s Bio Viva, Bill Andrews’s Sierra Sciences, along with Life Extension®, the Society for the Rescue of Our Elders, and others.

You can register to attend RAADfest 2018 by calling 1-480-345-6554 (24 hours) or log on to www.RAADfest.com

For longer life,

William Faloon, Volunteer Board Member
Coalition for Radical Life Extension
Is Sugar Aging You?

Mega Benfotiamine
Supports Healthy Blood Sugar Metabolism

Retail  Your Price

1 bottle  $30  $22.50
4 bottles  $20.25 each

Item #00925 • 120 vegetarian capsules

For full product description and to order Mega Benfotiamine, call 1-800-544-4440 or visit www.LifeExtension.com

These statements have not been evaluated by the Food and Drug Administration. This product is not intended to diagnose, treat, cure, or prevent any disease.
Geroprotect™ Longevity A.I.™ has been formulated using cutting-edge, artificial intelligence (AI) technology to modulate over 90 anti-aging pathways favorably affected by a calorie-restriction mimetic.

Longevity A.I.™ concentrates three unique geroprotective ingredients in one daily softgel.

For full product description and to order Geroprotect™ Longevity A.I.™, call 1-800-544-4440 or visit www.LifeExtension.com

<table>
<thead>
<tr>
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Item #02133 • 30 softgels

These statements have not been evaluated by the Food and Drug Administration. This product is not intended to diagnose, treat, cure, or prevent any disease.
Beneficial bacteria called *S. salivarius* K12 sustain throat health. Each **FLORASSIST® Throat Health** lozenge has 2 billion colony-forming units of *S. salivarius* K12 that:

- Maintain a balanced inflammatory response
- Help provide probiotic balance for throat health
- Maintain overall good health

**FLORASSIST® Throat Health**

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<th>Retail Price</th>
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For full product description and to order **FLORASSIST® Throat Health**, call 1-800-544-4440 or visit www.LifeExtension.com

BLIS K12® is the registered trademark of BLIS Technologies Limited.

These statements have not been evaluated by the Food and Drug Administration. This product is not intended to diagnose, treat, cure, or prevent any disease.
Many people don’t realize that the herb known as cilantro does not come from a plant of that name, but is in fact the leaves and stems of the coriander plant. As such, cilantro is related to cumin, dill, fennel, and anise.

Cilantro has been used in cooking for hundreds of years, and is known for its strong, citrus-like flavor, which pairs well with seasonings such as mint, basil, and turmeric. The tasty herb is also famed for its health benefits, such as:

### Anxiety relief
Cilantro has been found to have a significant calming effect, making it a good candidate as a natural treatment for relief of anxiety. In fact, high doses of cilantro extract were found to have effects similar to the popular anti-anxiety drug Valium®, but without that drug’s many distressing side effects, such as confusion, hallucinations, agitation, and memory problems.

### Elimination of Heavy Metals
The accumulation of toxic metals and chemical elements such as lead, mercury, aluminum, and arsenic in our bodies can have seriously detrimental health effects, including neurological damage, infertility, heart disease and hormonal imbalances. Cilantro can help counter these effects. It has been found to accelerate the elimination of heavy metals. In mice, simultaneous administration of cilantro extract protected against lead-induced oxidative stress.

### Wards off Infection
Cilantro helps protect against a wide range of diseases—including but not limited to salmonella, cholera, and food poisoning—due to its antibacterial properties. Research has shown that essential oil of cilantro is effective against *Listeria*.

### Fights Diabetes
In an animal study, cilantro extract has been shown to help lower blood sugar and support healthy liver function where diabetes is present. In accordance with their findings, the study authors recommend cilantro extract be included in diabetics’ diets.

**References**
The Blu Room® is a patented pending technology that creates an atmosphere and insulates the user from the daily environment. It provides the participant with a mind/body/spirit consciousness lifting environment that can augment one’s state of creative focus.

- Improved health and well-being
- Deepened focus
- Increased creativity
- Faster healing process
- Greater self-awareness
- Relief from physical pain
- Relief from mental stress & anxiety
- Significant source of vitamin D*

*Each 3 minutes of UVB provides a light-skinned person with an equivalent of around 10,000 IU of oral vitamin D and around 5,000 IU for a tanned or darker skinned person.

Find A Location at www.bluroom.com

Blu Room® is a registered trademark of JZ Knight used with permission.
Bartley J. Madden sees one major flaw in the American effort to bring effective medications to patients at the lowest prices. That flaw is called The Food and Drug Administration (FDA).

Madden, a senior fellow at the National Center for Policy Analysis, is an expert in the application of systems thinking—the study of how elements that can be seen as working together in a system interrelate and affect each other.

In his book, *Free to Choose Medicine*, Madden advocates bringing free-market competition to the FDA’s regulatory monopoly on the public’s access to new drugs. He suggests the creation of an alternative path to new medications featuring internet-based, up-to-the-minute information which doctors and their patients can use to assess the risks of particular drugs for themselves, free of the hidebound FDA thinking which, Madden believes, often does more harm than good.

In this interview with *Life Extension®,* Madden explains his view of the problematic nature of the FDA as it currently exists, how the system can be improved, and why he believes a grassroots movement advocating reform is necessary.
LE: What prompted your interest in FDA reform?

BJM: FDA reform became a top priority for me after reading the tragic details of how cancer patients were dying without access to the promising new drugs being tested in clinical trials. This struck me as an enormously important problem crying out for a solution.

LE: What’s your approach to this problem, in a nutshell?

BJM: My two main ideas for FDA reform are, number one, the FDA itself is the bottleneck in the drugs-to-patients system, the goal of which is better drugs, sooner, at lower cost. As a practical matter, the FDA’s continual push for more extensive clinical testing ignores the importance of providing new drugs sooner, at lower cost. Second, the system solution is to introduce consumer choice. Patients could then decide whether to use not-yet-approved new drugs based on their unique health conditions and risk preferences.

Anyone’s death from the denial of access to a promising new drug is profoundly sad for the victim’s family and loved ones. So too is the unnecessary pain and suffering of the much greater numbers of victims who are denied access to drugs that could significantly better manage their diseases.

LE: Could you give a specific example?

BJM: Multiple Sclerosis, or MS, is a disease of the nervous system that can cause difficulty in maintaining balance when walking, a painful loss of eyesight, and an almost constant state of fatigue.

An approved drug for treating MS, Tysabri®, demonstrated in clinical trials a remarkable ability to decrease relapses as well as the formation of additional brain lesions. But in 2005, following some reports of serious side effects, Tysabri® was pulled from the market. Many MS patients immediately pleaded with the FDA to restore access to Tysabri®, and the FDA eventually agreed. Even so, while the drug was off the market, hundreds of thousands of people suffered needless pain and worsening of their disease.

John Calfee, who worked as an economist with the American Enterprise Institute, reported survey responses of MS patients who were asked if they were willing to take their chances with Tysabri® despite its apparent one-in-1,000 chance of causing fatal complications. Roughly half of the patients said yes, they were willing to take the risk.

Additionally, 71% of the MS patients surveyed agreed with the following statements: “If a drug has safety concerns, the FDA should warn people, but I should be free to decide with my doctor whether to use those drugs or not,” and, “I am capable of making my own treatment choices, based on the information I get from my doctor.”

LE: It seems like the situation is more fluid and complex than the FDA allows for.

BJM: The amount of risk patients are willing to accept for potential improvement to their health is not static. Health conditions change over time, pain can become intolerable, the degeneration associated with Parkinson’s disease, MS, or Alzheimer’s often becomes disabling, and for some there is little hope for survival using the drugs that have secured conventional FDA approval.

Further, the sum total of useful data about drugs grows over time, leading doctors and patients to change their opinions about how effective and how risky a new drug might be.

With today’s system, the patient must meet the needs of the FDA’s mandated clinical trial criteria—or, in almost all cases, get nothing. A single arbitrary level of risk is chosen by the FDA’s risk-averse bureaucracy and imposed on everyone. Such a system cannot help but fail to achieve its stated objective of “advancing the public health by helping to speed innovations that make medicines and foods more effective, safer, and more affordable.”

LE: What do you see as missing from the current healthcare debate?

BJM: An understanding of the overall drugs-to-patients system and of the current government policies that needlessly delay access to drugs and greatly increase cost. Also missing is sufficient appreciation for the lives extended and quality-of-life improvements made possible by innovative drugs and medical devices.

To mention just one type of drug, the estimated monetary value to society of the HIV/AIDS therapies that were introduced by private-sector pharmaceutical companies, beginning in the late 1980s, is $1.4 trillion, according to a 2006 study. Of that total, 95% represented health benefits to patients and only 5% accrued to private-sector drug developers. That seems to have been a remarkably good bargain for society.

Concern over the cost of healthcare so dominates the attention of politicians and reform advocates that little attention is given to the role of innovation. It is innovation that yields highly effective
drugs... Ignored is the average billion-dollar cost that drug companies incur to obtain FDA approval for a new drug. Also ignored is the possibility that changing the current drug-approval process could substantially reduce the cost of new drugs.

**LE:** What about government intervention?

**BJM:** Imposing government price controls on drugs, rather than addressing innovation and the way patients get access to new drugs may seem easier and faster—a more direct route to solving an apparent problem. It is not. Price controls strict enough to have a substantial impact on drug costs would decimate investment in new drug development because developers would be unable to earn an adequate return on their investors' capital. Investment capital would go elsewhere. Small biotech companies—the source of so many of the new drugs that are revolutionizing medicine—would become an endangered species.

**LE:** Why do you think a grassroots movement for your “Free to Choose Medicine” approach doesn’t already exist?

**BJM:** Firstly, the nightly news keeps most of us frightened about serious side effects (including death) from the use of approved drugs. We rarely see stories blaming deaths on unnecessary regulatory delay by the FDA, even though a great many of such deaths occur for every one death due to an approved drug. Such lopsided coverage leads many people to believe that an even stronger FDA is needed to perform even more stringent testing of drugs. Moreover, few reporters understand that the discovery, testing, and sale of new drugs is a system—one that is failing because of the faulty design of one of its components. Or that suffering and deaths would be greatly reduced if promising new drugs moved faster through clinical testing.

Second, the FDA and its supporters erroneously choose to believe they are serving the public interest when they are highly motivated to preserve their authority by defending the status quo. They maintain their power, in part, by banging the drum of fear that any weakening of FDA powers would unleash a torrent of harmful drugs on the public. So far, that has worked. Pharmaceutical company experts who could contradict this claim are often silent out of fear of antagonizing the regulators whose decisions can spell the difference between their company's financial success or failure.

Third, most of us have not realized, thought about, or even been able to evaluate what economists call the “opportunity cost” of not being free to make an informed choice about the best drug treatment for ourselves. This freedom to choose is one we actually had prior to 1962, when legislation was enacted that greatly expanded the FDA, in effect granting it a monopoly over access to drugs, and thus preventing people from accessing medicines of their choice.

**LE:** Throughout your book, you stress a systems mindset that views the FDA as one component of a complex drugs-to-patients system. Why do you adopt this mindset?

**BJM:** Absent a systems mindset, most extensive FDA clinical testing is automatically viewed as a good thing regardless of the negative consequences elsewhere in the system. A fundamental central point is that the systems perspective provides the compelling argument that the FDA itself is the bottleneck in achieving the system's goal of better drugs, sooner, at lower cost.

Consumer choice and competition are the heart of a market system. They are especially relevant in achieving truly large-scale benefits from “Free to Choose Medicine.” This becomes apparent when you analyze how the FDA testing process works.

**LE:** Finally, what do you hope to accomplish with your book?

**BJM:** It lays out the practical tasks to begin building a reform movement that, if the book does the job I hope it will do, people will want to join. The core reason is this: We all want healthier, longer, and more productive lives for ourselves, our families, and all Americans.
Most of a coffee polyphenol content is destroyed during the typical roasting process.

Among the most beneficial of these polyphenols is chlorogenic acid.

Rainforest Blend coffee utilizes the patented Healthy Roast* process, which retains the naturally occurring polyphenols like chlorogenic acid.

A Patented Organic Roast
Life Extension*’s Rainforest Blends are made using a patented, 100% natural process consisting of 100% USDA certified organic arabica coffee beans.

Savory Taste Without Stomach Upset
The HealthyRoast* process also preserves special, naturally occurring compounds in coffee that soothe your stomach.

Tasty Decaf
Rainforest Blend is also available in a decaffeinated blend. The caffeine is removed through a chemical-free water process. It delivers the full flavor, aroma, and body of the arabica bean.

For full product description and to order either of the Rainforest Blend Coffees call 1-800-544-4440 or visit www.LifeExtension.com

* US Patent 6,723,368.
Renowned chef Jean-Christian Jury has for many years specialized in preparing vegan and raw-food dishes. His strong belief in health-promoting foods has culminated in his new book, *Vegan: The Cookbook*.

The recipes in Jury's book originate from countries all over the world. He credits his interest in exotic foods to his extensive travels, as well as his research into the origins and evolution of foods from ancient to modern times.

Jury advises that people who are interested in adopting a vegan diet first read up on the subject.

“A vegan diet, like every other diet, has to be balanced,” says Jury. “Your body and digestive system need time to adapt. Take always into consideration your health in the first place. To maintain a healthy immune system, your body needs garden fresh food, vitamins, enzymes, calories and minerals.”

Jury, a native of Toulouse, France, has run the acclaimed restaurant La Mano Verde in Berlin, Germany, since 2008. All of the recipes in *Vegan: The Cookbook* have been served there.

“For years,” he says, “my target was to surprise the non-vegan guests with our quality of cooking and imagination.”

Below, *Life Extension* has collected four delicious, nutritious recipes from Jury’s book. When preparing these meals, the chef recommends that you use the freshest ingredients you can find.

“Going vegan with garden fresh ingredients is the base of a healthy vegan diet,” he says.
FROM SOUTHERN KOREA:

Broccoli Soup with Ginger and Lemon
Preparation time: 25 minutes • Cooking time: 35 minutes, plus 20 minutes chilling • Serves 4

Two heads of broccoli, trimmed and separated into florets, stems reserved
Two tablespoons olive oil
One shallot, finely chopped
One tablespoon finely grated fresh ginger
Three cups vegetable stock (broth)
One teaspoon finely grated lemon zest
Two tablespoons fresh lemon juice
Salt and freshly ground black pepper
½ cup coconut milk
Two scallions (spring onions), finely chopped, to garnish
One tablespoon white sesame seeds, to garnish

Preheat the oven to 400°F/200°C/Gas Mark 6
Put the broccoli florets into an ovenproof dish, add one tablespoon of the olive oil and toss to coat. Bake for 20 minutes, until tender. Remove from the oven and set aside.

Heat the remaining olive oil in a saucepan over medium heat, add the shallot and stir fry for four minutes, until the shallot has softened. Add the ginger and cook for another two minutes. Add the broccoli stems, broth, and lemon zest and juice. Season to taste with salt and freshly ground black pepper, then bring to a simmer and cook for about 10 minutes, until the broccoli stems are tender.

Add the broccoli florets and bring to a boil, then remove the pan from the heat and set aside to cool for 20 minutes.

In a food processor or high-speed blender, purée the soup in batches until smooth. Return the soup to the saucepan, add the coconut milk and bring to a boil, stirring frequently. Then immediately remove the saucepan from the heat.

Ladle the soup into bowls, garnish with the scallions and white sesame seeds, and serve.

FROM KURDISTAN:

Chickpea and Cilantro Salad
Preparation time: 20 minutes • Cooking time: 15 minutes • Serves 4

Three tablespoons olive oil
Three cloves garlic, finely chopped
One red onion, finely chopped
One tablespoon ground cumin
One tablespoon finely chopped fresh ginger
½ teaspoon chopped piment d’espelette
Two tablespoons fresh lime juice
Nine oz. plum tomatoes, quartered
1 ¼ cups canned chickpeas, rinsed and drained
Salt and freshly ground black pepper
One bunch of cilantro (coriander), chopped

Heat the oil in a wok or deep saucepan over medium heat. Add the garlic and onion and stir-fry for five to six minutes, until golden brown. Add the cumin, mix to incorporate, and fry for another two minutes. Now add the ginger, chili, lime juice, tomatoes, and chickpeas, reduce the heat to low, and simmer for seven to eight minutes.

Season to taste with salt and freshly ground black pepper, then transfer to a large serving bowl. Sprinkle with the chopped cilantro and serve immediately.
Chickpea and Cilantro Salad

FROM CHAD:

Kidney Bean and Coconut Curry
Preparation time: 25 minutes • Cooking time: one hour 30 minutes • Serves 4

Two cups dried kidney beans, soaked in water overnight
Two tablespoons vegetable oil
Two red onions, chopped
Two tomatoes, chopped
Two cups coconut milk
One teaspoon ground cardamom
Two cloves garlic, crushed
One teaspoon yellow curry powder
One green chili, seeded and finely chopped
Salt
Two tablespoons chopped cilantro (coriander), to garnish
Cooked basmati or jasmine rice, to serve

Rinse and drain the soaked kidney beans. Fill a large saucepan with enough water to cover the kidney beans and bring to a boil. Add the beans, bring to a simmer, and cook over low heat for one hour, until the beans are tender. Drain and set aside.

Heat the vegetable oil in a large saucepan over medium heat. Add the onion and stir fry for three to four minutes, until the onion becomes golden brown. Add the tomatoes and cook for four to five minutes. Add the coconut milk, cardamom, garlic, curry powder, and chili and season to taste with salt. Mix well to blend the ingredients together and bring the mixture to a simmer. Cook over low heat for 20 minutes.

Transfer to a large serving bowl, garnish with the cilantro, and serve with rice.

FROM SPAIN:

Peppers Stuffed with Quinoa and Zucchini
Preparation time: 20 minutes • Cooking time: 50 minutes, plus 15 minutes cooling • Serves 4

Two red bell peppers
Two cups quinoa, cooked according to the packet instructions
Two cups shredded zucchini (courgette) or summer squash
One tablespoon chopped basil
½ cup tomato sauce or crushed tomatoes
One clove garlic, finely chopped
½ cup grated vegan mozzarella cheese
Salt and freshly ground black/white pepper

Preheat the broiler (grill).

Arrange the peppers in a broiling (grill) pan and broil for about 20 minutes, until they are soft and the skin just beginning to become brown. Let cool for 15 minutes, then halve peppers lengthwise, remove the seeds and transfer to a baking pan.

Preheat the oven to 400°F/200°C/Gas Mark 6

Combine the quinoa, zucchini or squash, basil, tomato sauce, garlic, and half of the cheese in a large bowl and season to taste with salt and freshly ground white/black pepper. Divide the quinoa mixture equally among the pepper halves; top with the remaining cheese. Bake for 15 minutes, until the cheese has melted and is golden brown. Serve immediately.

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

To order Vegan: The Cookbook, call 1-800-544-4440 or visit www.LifeExtension.com
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  - Total cholesterol • Triglycerides
  - HDL cholesterol • LDL cholesterol (calc.)
  - VLDL cholesterol (calc.)
  - Total cholesterol/HDL ratio
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- **Liver Function:**
  - Alkaline phosphatase • LDH (lactate dehydrogenase)
  - AST (aspartate aminotransferase)
  - ALT (alanine transaminase)
  - Total protein • Albumin • Globulin
  - Albumin/globulin ratio • Bilirubin

- **Electrolytes and Minerals:**
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  - Calcium • Phosphorus • Iron

- **Blood Sugar:**
  - Glucose

- **Kidney Function:**
  - Uric acid • BUN (blood urea nitrogen)
  - Creatinine • BUN/creatinine ratio
  - eGFR (estimated glomerular filtration rate)

- **Complete Blood Count:**
  - Red blood cell count • Hemoglobin
  - Hematocrit • MCV (mean corpuscular volume)
  - MCH (mean corpuscular hemoglobin)
  - MCHC (mean corpuscular hemoglobin concentration)
  - RDW (red blood cell distribution)

- **Immune Cell Differentiation Count**
- **Platelet count**

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**NEUROTRANSMITTER BASIC PANEL** (LC100058)

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- Alternations in these six neurotransmitters play a significant role in contributing to symptoms such as cognitive disorders, depression, anxiety, diminished drive, fatigue and sleep difficulties, cravings, addictions, pain and more! Not available in NY.

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- With only a saliva sample, you can identify your risk for 25 hereditary cancers by analyzing 98 genes from your DNA including the well-known BRCA1, BRCA2, TP53, and APC.
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- Apolipoprotein E (ApoE) is an important regulator of cholesterol and triglycerides levels in your blood and supports lipid transport and injury repair in your brain. Genetically, E4 is the strongest risk factor for developing Late Onset Alzheimer’s disease. According to the National Institute of Health, inheriting a single copy of ApoE4 increases the risk of Alzheimer’s disease by about three-fold. Inheriting two copies increases the risk by about 12-fold. In fact, almost 40% of AD patients have inherited an E4 allele.

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**PAIN MEDICATION DNA INSIGHT® PROFILE** (LC100069)

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**MENTAL HEALTH DNA INSIGHT® PROFILE** (LC100068)

- The Mental Health DNA Insight® profile helps you understand your body’s likely response to 50+ psychiatric medications.
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- L-Arginine Caps
- L-Carnitine
- L-Glutamine
- L-Glutamine Powder
- L-Lysine
- L-Taurine Powder
- L-Tyrosine Powder
- Super Carnosine
- Taurine

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- Arterial Protect
- Blood Pressure Monitor Arm Cuff
- Dual Action Blood Pressure
- Endothelial Defense™ with Pomegranate Complete and CORDIART™
- Endothelial Defense™ with GliSODin®
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- NitroVasc with CORDIART™
- Pomegranate Complete
- Pomegranate Fruit Extract
- Triple Action Blood Pressure AM/PM
- VenoFlow™

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- Bone Restore-Sugar Free
- Bone Restore with Vitamin K2
- Bone Strength Formula with KoAct®
- Bone-Up™
- Calcium Citrate with Vitamin D
- Dr. Strum’s Intensive Bone Formula
- Strontium Caps

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- Acetyl-L-Carnitine Arginate
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- Brain Shield® Gastrodin
- CocoaMind™
- Cognitex™ Basics
- Cognitex® with Brain Shield™
- Cognizin® CDP-Choline Caps
- DMAE Bitartrate (dimethylaminoethanol)
- Dopa-Mind™
- Ginkgo Biloba Certified Extract™
- Huperzine A
- Lecithin Granules
- Memory Protect
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- Optimized Ashwagandha Extract
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- CHOL Support™
- Red Yeast Rice
- Theaflavins Standardized Extract
- Vitamin B3 Niacin Capsules

## Digestion Support
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- Effervescent Vitamin C - Magnesium Crystals
- Enhanced Super Digestive Enzymes
- Enhanced Super Digestive Enzymes w/Probiotics
- EsophaGuard™
- Esophageal Guardian

## Extraordinary Enzymes
- Gastro-Ease™
- Ginger Force™
- Pancreatin
- Regimin
- Tranquil Tract™
- TruFiber™
- WellBetX PGX plus Mulberry

## Energy Management
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- Asian Energy Boost
- D-Riboce Powder
- D-Riboce Tablets
- Forskolin
- Mitochondrial Basics with BioPOQ™
- Mitochondrial Energy Optimizer with PQO™
- NAD+ Cell Regenerator™
- Optimized NAD+ Cell Regenerator™ with Resveratrol
- PQQ Caps
- Rhodiola Extract
- RiboGen™ French Oak Wood Extract
- Triple Action Thyroid

## Eye Health
- Astaxanthin with Phospholipids
- Brite Eyes™
- Certified European Bilberry Extract
- Eye Pressure Support with Mirtogenol®
- MacuGuard® Ocular Support
- MacuGuard® Ocular Support with Astaxanthin
- Tear Support with MaquiBright®

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- OMEGA FOUNDATIONS® Mega GLA with Sesame Lignans
- OMEGA FOUNDATIONS® Omega 3 (EP/AHA)
- OMEGA FOUNDATIONS® Super Omega 3 EPA/DHA with Sesame Lignans & Olive Extract
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- OMEGA FOUNDATIONS® Provaln® Purified Omega-7
- OMEGA FOUNDATIONS® Vegetarian DHA Organic Golden Flax Seed

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- Rainforest Blend Ground Coffee
- Rainforest Blend Ground Mocha Flavor
- Rainforest Blend Whole Bean Coffee
- Stivia Sweetener

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- Glycemic Guard™
- Mega BenfoThiazine
- Tri Sugar Shield™

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- Super-Absorbable CoQ10 Ubiquinone with d’Limonene
- TMG Powder
- TMG Liquid Capsules

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- Immune Protect with PARIACTIN®
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- NK Cell Activator™
- Optimized Garlic
- Optimized Quercetin
- Peony Immune
- ProBoost Thymic Protein A
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## Inflammation Management
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- Black Cumin Seed Oil with Bio-Curcumin®
- Boswella
- Comfort Max™
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- Super Bio-Curcumin®
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## Joint Support
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- ArthroMax® Advanced with UC-II® & AprèsFlex®
- ArthroMax® with Theaflavins & AprèsFlex®
- ArthroMax® Herbal Joint Formula
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- MSM (Methylsulfonylmethane)

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- Optimized Cran-Max® with Ellirose™
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- 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
- Alpha-Lipoic Acid
- AppleRipe Polyphenol Extract
- Berry Complete
- Blueberry Extract
- Blueberry Extract with Pomegranate
- DNA Protection Formula
- Enhanced Berry Complete with Acai
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#### Men's Health
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- PalmettoGuard® Saw Palmetto with Beta-Sitosterol
- Pomi-T®
- Prenol® Enhanced Sex for Men
- SuperMiraforte with Standardized Lignans
- Triple Strength ProstaPollen™
- Ultra Natural Prostate

#### Minerals
- Boron
- Extend-Release Magnesium
- Ionic Selenium
- Iron Protein Plus
- Magnesium (Citrate)
- Magnesium Caps
- Only Trace Minerals
- Optimized Chromium with Crominex® 3+
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- Se-Methyl L-Selenocysteine
- Vanadyl Sulfate
- Zinc Caps

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- Enhanced Stress Relief
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- Comprehensive Nutrient Packs ADVANCED
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- Life Extension Mix™ Capsules
- Life Extension Mix™ Powder without Copper
- 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

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- Dr. Proctor’s Advanced Hair Formula
- Dr. Proctor’s Shampoo
- European Leg Solution Featuring Certified Diosmin 95
- Hair, Skin & Nail Rejuvenation Formula w/VERISOL®
- Hair Suppress Formula
- Life Extension Toothpaste
- Sinus Cleanser
- Venotone
- Xylitol Mouthwash

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- Dog Mix

#### Probiotics
- Bifido GI Balance
- FLORASSIST® Balance
- FLORASSIST® GI with Phage Technology
- FLORASSIST® Heart Health
- FLORASSIST® Immune Health
- FLORASSIST® Mood
- FLORASSIST® Oral Hygiene
- FLORASSIST® Prebiotic
- FLORASSIST® Throat Health
- Jarro-Dophilus® for Women
- Therabliss® Probiotics
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#### Skin Care
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- Advanced Growth Factor 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-Aging Rejuvenating Scalp Serum
- Anti-Glycation Serum with Blueberry & Pomegranate Extracts
- Antioxidant Facial Mist Hydrator
- Anti-Redness & Adult Blemish Lotion
- Collagen Boosting Peptide Serum
- DNA Repair Cream
- Environmental Support Serum
- Essential Plant Lipids Reparative Serum
- Eye Lift Cream
- Face Rejuvenating Anti-Oxidant Cream
- Healing Formula
- Healing Vitamin K Cream
- Hyaluronic Facial Moisturizer
- Hyaluronic Oil-Free Facial Moisturizer
- Hydrating Anti-Oxidant Facial Mist
- Hydroderm
- Lifting & Tightening Complex
- Melatonin Cream
- Mild Facial Cleanser
- Multi Stem Cell Skin Tightening Complex
- Neck Rejuvenating Anti-Oxidant Cream
- Rejuvex® Body Lotion
- Rejuvex® Factor Firming Serum
- Resveratrol Anti-Oxidant Serum
- Shade Factor™
- Shade Factor™ Sunscreen Lotion
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- Skin Care Collection Anti-Aging Serum
- Skin Care Collection Body Lotion
- Skin Care Collection Day Cream
- Skin Care Collection Night Cream
- Skin Firming Complex
- Skin Lightening Serum
- Skin Restoring Phytoceamide with Lipohexate®
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- Skin Tone Equalizer
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- Tightening & Firming Neck Cream
- Triple-Action Vitamin C Cream
- Ultimate MicroDermabrasion
- Ultra Eyelash Booster
- Ultra Lip Plumper
- Ultra Rejuvenex®
- Ultra Rejuvenex® Night
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- Under Eye Rescue Cream
- Vitamin C Serum
- Vitamin D Lotion
- Vitamin E-essential Cream
- Youth Serum

#### Sleep
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- Glycine
- L-Tryptophan
- Melatonin
- Optimized Tryptophan Plus
- Quiet Sleep Melatonina

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- New Zealand Whey Protein Concentrate (Natural Chocolate and Vanilla Flavor)
- Tart Cherry with CherryPure®
- Plant Protein Complete & Amino Acid Complex
- Whey Protein Isolate (Chocolate and Vanilla Flavor)

#### Vitamins
- Ascorbyl Palmitate
- Benfotiamine with Thiamine
- Beta-Carotene
- BioActive Complete B-Complex
- Biotin
- Buffered Vitamin C Powder
- Fast-C® with Dihydroquercetin
- Gamma E Mixed Tocopherol Enhanced with Sesame Lignans
- Gamma E Mixed Tocopherol/Tocotrienols
- High Potency Optimized Folate
- Inositol Caps
- Liquid Emulsified Vitamin D3
- Liquid Vitamin D3
- Low-Dose Vitamin K2
- Methylcobalamin
- MK-7
- No Flush Niacin
- Optimized Folate (L-Methylfolate)
- Pantothenic Acid (Vitamin B-5)
- Pyridoxal 5’-Phosphate Caps
- Super Absorbable Tocotrienols
- Super K with Advanced K2 Complex
- Super Vitamin E
- Vitamin 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 Support
- AMPK Metabolic Activator
- CalReduce Selective Fat Binder
- DHEA Complete
- Garcinia HCA
- HCAActive™ Garcinia Cambogia Extract
- Integra-Lean®
- Mediterranean Trim with Sinetrol™-XPur
- Optimized Irvingia with Phase 3™ Calorie Control Complex
- Optimized Saffron with Satireal®
- Super Citrimax®
- 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
- Progesta-Care®
- Super-Absorbable Soy Isoflavones
- Ultra Soy Extract

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**Note:** The above text is a direct transcription of the document image. For any further analysis or specific queries, please refer to the individual entries for detailed information.
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**SUBTOTAL OF COLUMN 1**

**SUBTOTAL OF COLUMN 2**

TO ORDER ONLINE VISIT: www.LifeExtension.com

MARCH 2018

RECEIVE 25% OFF THE RETAIL PRICE OF ALL PRODUCTS
### COSMESIS

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<td>80154</td>
<td>ADVANCED LIGHTENING CREAM • 1 oz</td>
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**SUBTOTAL OF COLUMN 3**

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**SUBTOTAL OF COLUMN 4**

**RECEIVE 25% OFF THE RETAIL PRICE OF ALL PRODUCTS**

**MARCH 2018**
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**SUBTOTAL OF COLUMN 5**

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<tr>
<td>02222</td>
<td>DIGESTIVE ENZYMES w/PROBIOTICS (Enhanced Super) • 60 veg. caps</td>
<td>28.00</td>
<td>21.00</td>
<td>18.00</td>
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<td></td>
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<tr>
<td>01671</td>
<td>D, L-PHENYLALANINE • 500 mg, 100 veg. caps</td>
<td>18.75</td>
<td>14.06</td>
<td>12.00</td>
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<td></td>
</tr>
<tr>
<td>01540</td>
<td>DMAE BITARTRATE • 150 mg, 200 veg. caps</td>
<td>18.00</td>
<td>13.50</td>
<td>11.25</td>
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<tr>
<td>02270</td>
<td>DNA PROTECTION FORMULA • 30 veg. caps</td>
<td>20.00</td>
<td>15.00</td>
<td>13.50</td>
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<tr>
<td>01931</td>
<td>DOG MIX • 100 grams powder</td>
<td>18.00</td>
<td>13.50</td>
<td>11.25</td>
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<tr>
<td>02006</td>
<td>DOPA-MIND® • 60 veg. tabs</td>
<td>44.00</td>
<td>33.00</td>
<td>28.00</td>
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<tr>
<td>00321</td>
<td>DR. PROCTOR’S ADVANCED HAIR FORMULA • 2 oz</td>
<td>39.95</td>
<td>29.96</td>
<td>24.00</td>
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<tr>
<td>00320</td>
<td>DR. PROCTOR’S HAIR SHAMPOO • 8 oz</td>
<td>24.95</td>
<td>18.71</td>
<td>16.50</td>
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</tr>
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**SUBTOTAL OF COLUMN 6**

**RECEIVE 25% OFF THE RETAIL PRICE OF ALL PRODUCTS**
<table>
<thead>
<tr>
<th>ITEM No.</th>
<th>PRODUCT</th>
<th>UNIT QUANTITY</th>
<th>RETAIL EACH</th>
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</thead>
<tbody>
<tr>
<td>02257</td>
<td>LIFE EXTENSION MIX™ W/EXTRA NIACIN • 240 tablets</td>
<td>1</td>
<td>74.00</td>
</tr>
<tr>
<td>02254</td>
<td>LIFE EXTENSION MIX™ • 360 caps</td>
<td>1</td>
<td>78.00</td>
</tr>
<tr>
<td>02256</td>
<td>LIFE EXTENSION MIX™ POWDER • 12.70 oz</td>
<td>1</td>
<td>72.00</td>
</tr>
<tr>
<td>02265</td>
<td>LIFE EXTENSION MIX™ • 240 tablets w/o copper</td>
<td>1</td>
<td>74.00</td>
</tr>
<tr>
<td>02264</td>
<td>LIFE EXTENSION MIX™ • 360 caps w/o copper</td>
<td>1</td>
<td>78.00</td>
</tr>
<tr>
<td>01639</td>
<td>5-LOX INHIBITOR W/APRÉSFLEX® • 100 mg, 60 veg. caps</td>
<td>1</td>
<td>22.00</td>
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<tr>
<td>01678</td>
<td>L-lysine • 620 mg, 100 veg. caps</td>
<td>1</td>
<td>9.00</td>
</tr>
<tr>
<td>00455</td>
<td>LYCOPEINE (Mega) • 15 mg, 90 softgels</td>
<td>1</td>
<td>35.00</td>
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<tr>
<td>01992</td>
<td>MACUGUARD® OCULAR SUPPORT w/SAFFRON® • 60 softgels</td>
<td>1</td>
<td>25.00</td>
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<tr>
<td>01993</td>
<td>MACUGUARD® OCULAR SUPPORT w/SAFFRON &amp; ASTAXANTHIN • 60 softgels</td>
<td>1</td>
<td>44.00</td>
</tr>
<tr>
<td>01459</td>
<td>MAGNESIUM CAPS • 500 mg, 100 veg. caps</td>
<td>1</td>
<td>12.00</td>
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<tr>
<td>01682</td>
<td>MAGNESIUM (CITRATE) • 160 mg, 100 veg. caps</td>
<td>1</td>
<td>13.00</td>
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<tr>
<td>02107</td>
<td>(EXTEND-RELEASE) MAGNESIUM • 60 veg. caps</td>
<td>1</td>
<td>13.00</td>
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<tr>
<td>01908</td>
<td>MEDITERRANEAN TRIM WITH SINETROL®X-PUR • 60 veg. caps</td>
<td>1</td>
<td>18.00</td>
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<tr>
<td>02109</td>
<td>MEDITERRANEAN WHOLE FOOD BLEND • 90 veg. caps</td>
<td>1</td>
<td>44.00</td>
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<tr>
<td>01668</td>
<td>MELATONIN • 300 mcg, 100 veg. caps</td>
<td>1</td>
<td>7.00</td>
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<tr>
<td>01883</td>
<td>MELATONIN • 500 mcg, 200 veg. caps</td>
<td>1</td>
<td>18.00</td>
</tr>
<tr>
<td>00329</td>
<td>MELATONIN • 1 mg, 60 caps</td>
<td>1</td>
<td>5.00</td>
</tr>
<tr>
<td>00330</td>
<td>MELATONIN • 3 mg, 60 veg. lozenges</td>
<td>1</td>
<td>8.00</td>
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<tr>
<td>00331</td>
<td>MELATONIN • 10 mg, 60 veg. lozenges</td>
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<td>28.00</td>
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<tr>
<td>00332</td>
<td>MELATONIN • 3 mg, 60 veg. lozenges</td>
<td>1</td>
<td>8.00</td>
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<tr>
<td>01734</td>
<td>MELATONIN (Fast-Acting Liquid) • 2 fl oz (Citrus-Vanilla)</td>
<td>1</td>
<td>12.00</td>
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<tr>
<td>01787</td>
<td>MELATONIN TIMED RELEASE • 300 mcg, 100 veg. tabs</td>
<td>1</td>
<td>12.00</td>
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<tr>
<td>01788</td>
<td>MELATONIN TIMED RELEASE • 750 mcg, 60 veg. tablets</td>
<td>1</td>
<td>8.00</td>
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<tr>
<td>01786</td>
<td>MELATONIN TIMED RELEASE • 3 mg, 60 veg. tabs</td>
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<tr>
<td>02101</td>
<td>MEMORY PROTECT • 36 day supply</td>
<td>1</td>
<td>24.00</td>
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<tr>
<td>01536</td>
<td>METHYLCOBALAMIN • 1 mg, 60 veg. lozenges (vanilla)</td>
<td>1</td>
<td>9.95</td>
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<tr>
<td>01537</td>
<td>METHYLCOBALAMIN • 5 mg, 60 veg. lozenges (vanilla)</td>
<td>1</td>
<td>32.00</td>
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<tr>
<td>00709</td>
<td>MIGRA-EEZE™ (Butterbur) • 60 softgels</td>
<td>1</td>
<td>33.00</td>
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<tr>
<td>01522</td>
<td>MILK THISTLE (European) • 60 veg. caps</td>
<td>1</td>
<td>34.00</td>
</tr>
<tr>
<td>01922</td>
<td>MILK THISTLE (European) • 60 softgels</td>
<td>1</td>
<td>28.00</td>
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<tr>
<td>01925</td>
<td>MILK THISTLE (European) • 125 softgels</td>
<td>1</td>
<td>44.00</td>
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<tr>
<td>01404</td>
<td>MIRAFORTE w/STANDARDIZED LIGNANS (Super) • 120 veg caps</td>
<td>1</td>
<td>62.00</td>
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<tr>
<td>01869</td>
<td>MITOCHONDRIAL BASICS W/BIOPOQ® • 30 caps</td>
<td>1</td>
<td>40.00</td>
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<tr>
<td>01868</td>
<td>MITOCHONDRIAL ENERGY OPTIMIZER w/PQQ®•120 caps</td>
<td>1</td>
<td>68.00</td>
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<tr>
<td>00905</td>
<td>MK-7® • 90 mcg, 60 softgels</td>
<td>1</td>
<td>29.00</td>
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<tr>
<td>00451</td>
<td>MSM (Methylsulfonylmethane) • 1,000 mg, 100 caps</td>
<td>1</td>
<td>14.00</td>
</tr>
<tr>
<td>01534</td>
<td>N-ACETYLY-L-CYSTEINE • 600 mg, 60 veg. caps</td>
<td>1</td>
<td>14.00</td>
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<tr>
<td>01904</td>
<td>NAD+ CELL REGENERATOR™ • 100 mg, 30 veg. caps</td>
<td>1</td>
<td>22.00</td>
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<tr>
<td>02144</td>
<td>NAD+ CELL REGENERATOR™ NICOTINAMIDE RIBOSIDE • 250 mg, 30 veg. caps</td>
<td>1</td>
<td>42.00</td>
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<tr>
<td>02148</td>
<td>NAD+ CELL REGENERATOR™ w/RESVERATROL (Optimized) • 30 veg. caps</td>
<td>1</td>
<td>48.00</td>
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**SUBTOTAL OF COLUMN 7**
<table>
<thead>
<tr>
<th>ITEM No.</th>
<th>PRODUCT</th>
<th>YOUR PRICE</th>
<th>QTY Total</th>
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<tbody>
<tr>
<td>00525</td>
<td>PROBOST™ THYMIC PROTEIN A • 30 packets</td>
<td>66.60 49.95</td>
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<tr>
<td>01441</td>
<td>PROGESTA-CARE® • 4 oz cream</td>
<td>36.39 27.29</td>
<td>25.72</td>
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<tr>
<td>02029</td>
<td>PROSTATE FORMULA (Utra Natural) • 60 softgels</td>
<td>38.00 28.50</td>
<td>26.25 24.00</td>
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<tr>
<td>01909</td>
<td>PROSTAPOLLEN® (Triple strength) • 30 softgels</td>
<td>28.00 21.00</td>
<td>18.75</td>
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<tr>
<td>01742</td>
<td>PROTEIN-ISOLATE (Whey) Vanilla • 403 grams</td>
<td>30.00 22.50</td>
<td>19.50</td>
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<tr>
<td>01743</td>
<td>PROTEIN-ISOLATE (Whey) Chocolate • 437 grams</td>
<td>30.00 22.50</td>
<td>19.50</td>
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<tr>
<td>01770</td>
<td>PROTEIN CONCENTRATE (New Zealand Whey) Vanilla 500 grams</td>
<td>30.00 22.50</td>
<td>19.50</td>
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<tr>
<td>01771</td>
<td>PROTEIN CONCENTRATE (New Zealand Whey) Chocolate 640 grams</td>
<td>30.00 22.50</td>
<td>19.50</td>
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<td>02127</td>
<td>PROTEIN (PLANT) COMPLETE &amp; AMINO ACID COMPLEX 15.87 oz</td>
<td>34.00 25.50</td>
<td>23.00</td>
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<tr>
<td>01812</td>
<td>PROVINAL® PURIFIED OMEGA-7 • 30 softgels</td>
<td>27.00 20.25</td>
<td>18.00</td>
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<tr>
<td>01676</td>
<td>PS CAPS (Phosphatidylserine) • 100 mg, 100 veg. caps</td>
<td>54.00 40.50</td>
<td>36.00</td>
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<tr>
<td>01508</td>
<td>PEPTOPURE® Phosphatidylserine • 50 mg, 60 veg. caps</td>
<td>32.00 24.00</td>
<td>22.50</td>
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<tr>
<td>01209</td>
<td>PUMPKIN SEED EXTRACT (Water-soluble) • 60 veg. caps</td>
<td>20.00 15.00</td>
<td>13.50</td>
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<tr>
<td>01637</td>
<td>Pycnogenol® FRENCH MARITIME PINE BARK EXTRACT 100 mg, 60 veg. caps</td>
<td>64.00 48.00</td>
<td>45.00</td>
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<tr>
<td>01217</td>
<td>PYRIDOXAL 5'-PHOSPHATE • 100 mg, 60 veg. caps</td>
<td>22.00 16.50</td>
<td>14.85</td>
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<tr>
<td>01309</td>
<td>QUERCETIN (optimized) • 250 mg, 60 veg. caps</td>
<td>22.00 16.50</td>
<td>15.00</td>
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<tr>
<td>01030</td>
<td>RED YEAST RICE (Bluebonnet) • 600 mg, 60 veg. caps</td>
<td>18.08 13.56</td>
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<tr>
<td>00605</td>
<td>REGIMINT • 60 enteric-coated caps</td>
<td>19.95 14.96</td>
<td>14.00</td>
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<tr>
<td>01708</td>
<td>REISHI EXTRACT MUSHROOM COMPLEX • 60 veg. caps</td>
<td>30.00 22.50</td>
<td>20.25</td>
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<tr>
<td>01448</td>
<td>REJUVENEX® BODY LOTION • 5 fl. oz</td>
<td>24.00 18.00</td>
<td>14.85 12.75</td>
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<tr>
<td>01621</td>
<td>REJUVENEX® FACTOR FIRMING SERUM • 1.7 oz</td>
<td>65.00 48.75</td>
<td>37.50</td>
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<tr>
<td>01220</td>
<td>REJUVENEX® (ULTRA) • 2 oz</td>
<td>52.00 39.00</td>
<td>33.00 29.25</td>
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<td>00676</td>
<td>REJUVENIGHT® (ULTRA) • 2 oz</td>
<td>39.95 29.96</td>
<td>27.00</td>
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<td>01410</td>
<td>RESVERATROL W/PEPTOSILBENE • 100 mg, 90 veg. caps</td>
<td>36.00 27.00</td>
<td>24.00</td>
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<tr>
<td>00303</td>
<td>RESVERATROL (Optimized) • 60 veg. caps</td>
<td>46.00 34.50</td>
<td>31.00</td>
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<tr>
<td>00889</td>
<td>RHODIOLA EXTRACT • 250 mg, 60 veg. caps</td>
<td>14.00 10.50</td>
<td>9.00</td>
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<tr>
<td>01900</td>
<td>RIBOGEN® FRENCH OAK WOOD EXTRACT 200 mg, 30 veg. caps</td>
<td>36.00 27.00</td>
<td>24.75</td>
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<tr>
<td>00972</td>
<td>(D) RIBOSE POWDER • 150 grams</td>
<td>27.50 20.63</td>
<td>18.56</td>
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<tr>
<td>01473</td>
<td>(D) RIBOSE TABLETS • 100 veg. tabs</td>
<td>32.00 24.00</td>
<td>21.00</td>
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<tr>
<td>02169</td>
<td>RAINFOREST BLEND GROUND COFFEE • 12 oz. bag</td>
<td>13.00 9.75</td>
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<tr>
<td>02173</td>
<td>RAINFOREST BLEND GROUND COFFEE Natural Mocha • 12 oz. bag</td>
<td>15.00 11.25</td>
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<tr>
<td>02172</td>
<td>RAINFOREST BLEND GROUND COFFEE Natural Vanilla • 12 oz. bag</td>
<td>15.00 11.25</td>
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<tr>
<td>02171</td>
<td>RAINFOREST BLEND WHOLE BEAN COFFEE 12 oz. bag</td>
<td>13.00 9.75</td>
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<tr>
<td>02170</td>
<td>RAINFOREST BLEND DECAFENATED ROAST GROUND COFFEE 12 oz. bag</td>
<td>14.00 10.50</td>
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<tr>
<td>02180</td>
<td>R-LIPIDIC ACID (Super) • 240 mg, 60 veg. caps</td>
<td>49.00 36.75</td>
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<tr>
<td>00070</td>
<td>RNA CAPSULES • 500 mg, 100 caps</td>
<td>17.95 13.46</td>
<td>12.12</td>
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<tr>
<td>01432</td>
<td>Saffron w/SATIEREAL® (optimized) • 60 veg. caps</td>
<td>36.00 27.00</td>
<td>24.00</td>
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<tr>
<td>01935</td>
<td>SAMe (S-ADENOSYL-METHIONINE) 200 mg, 30 enteric coated tablets</td>
<td>25.00 18.75</td>
<td>16.50</td>
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**SUBTOTAL OF COLUMN 9**
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<tr>
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<th>PRODUCT</th>
<th>Retail Each</th>
<th>1 Unit Each</th>
<th>4 Unit Each</th>
<th>10 Unit Each</th>
<th>QTY Total</th>
</tr>
</thead>
</table>

**TRIPLE ACTION THYROID** • 60 veg. caps
02030
36.00
27.00
24.00

**TRI SUGAR SHIELD** • 60 veg. caps
01803
36.00
27.00
24.00

**TRUFLIBER** • 180 grams
01396
32.95
24.71

**TRUFLORA** PROBIOTICS • 32 veg. caps
01399
42.95
32.21

**L-TRYPTOPHAN** • 500 mg, 90 veg. caps
01722
83.00
24.75
22.50

**TRYPTOPHAN PLUS** (Optimized) • 90 veg. caps
01721
12.00
9.00
8.00

**TWO-PER-DAY** • 60 tablets
02216
21.00
15.75
14.00

**TWO-PER-DAY** • 120 tablets
02215
12.00
9.00
8.00

**TWO-PER-DAY** • 60 caps
02217
12.00
9.00
8.00

**TWO-PER-DAY** • 120 caps
02218
24.00
18.00
16.00

**L-TYROSINE** • 500 mg, 100 tablets
00326
13.50
10.13

<table>
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**URIC ACID CONTROL** • 60 veg. caps
00921
24.00
18.00
16.50

**VANADYL SULFATE** • 7.5 mg, 100 veg. tablets
02102
15.00
11.25
9.38

**VENFLOW** • 30 veg. caps
00408
52.00
39.00
36.00

**VENOTONE** • 60 caps
01327
18.85
14.21
12.00

**VINPOCETINE** • 10 mg, 100 veg. tablets
00927
18.00
13.50
10.50

**VITAMIN B3 NIACIN** • 500 mg, 100 caps
02028
14.00
10.50
9.50

**VITAMIN B6** • 250 mg, 100 veg. caps
01535
12.50
9.38
8.25

**VITAMIN B12** • 500 mcg, 100 lozenges
00381
8.75
6.56
5.44

**VITAMIN C w/DIHYDROQUERCETIN** 1,000 mg, 60 veg. tablets
01634
10.00
7.50
6.75

**VITAMIN C w/DIHYDROQUERCETIN** 1,000 mg, 250 veg. tablets
00927
30.00
22.50
20.00

**VITAMIN C POWDER (BUFFERED) 454 grams**
00084
28.00
21.00
19.00

**VITAMIN C-MAGNESIUM CRYSTALS (EFFERVESCENT) 180 grams**
01736
20.00
15.00
13.50

**VITAMIN D3** • 2,000 IU, 1 fl. oz. Mint flavor
01732
28.00
21.00
18.75

**VITAMIN D3** • 1,000 IU, 60 softgels
01753
7.00
5.25
4.50

**VITAMIN D3** • 1,000 IU, 250 softgels
01751
12.50
9.38
8.44

**VITAMIN D3** • 5,000 IU, 60 softgels
01712
10.00
7.50
6.50

**VITAMIN D3** • 7,000 IU, 60 softgels
01718
14.00
10.50
9.45

**VITAMIN D3 W/SEA-IODINE** • 5,000 IU, 60 caps
01758
14.00
10.50
9.38

**VITAMIN D3 LIQUID** • 2,000 IU, 1 fl. oz
00864
28.00
21.00
18.75

**VITAMINS D AND K W/SEA-IODINE** • 60 caps
02040
24.00
18.00
16.50

**VITAMIN E (Super) • 400 IU, 90 softgels**
01860
28.00
21.00
19.50
18.00

**VITAMIN K2 (Lysine) • 45 mg, 90 softgels**
01906
18.00
13.50
12.00

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**WAIST-LINE CONTROL** • 120 veg. caps
01902
42.00
31.50
28.50

**X-R SHIELD** • 90 veg. caps
01919
15.00
11.25
9.75

**XYLIWHITE® MOUTH WASH** • 16 oz
00428
10.00
7.50

<table>
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<th>Z</th>
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**ZINC HIGH POTENCY** • 50 mg, 90 veg. caps
01613
7.95
5.96
5.25

**ZINC LOZENGE** • 60 veg. lozenges
01561
9.00
6.75
6.00

**ZINC LOZENGE** (Enhanced) • 30 veg. lozenges
01961
12.00
9.00
6.00

**ZYFLAMEND® WHOLE BODY** • 120 liquid veg. caps
01651
72.95
54.71

**BOOKS**

**THE RIGHT TO TRY** by Darcy Olsen • 2016
33998
26.99
20.24

**THE TRUTH ABOUT MEN AND SEX** by Abraham Morgentaler, MD, FACS • 2015
33977
16.99
12.74

**DOCTORED: THE DISILLUSIONMENT OF AN AMERICAN PHYSICIAN** by Sandeep Jauhar • 2015
33875
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