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August 2022

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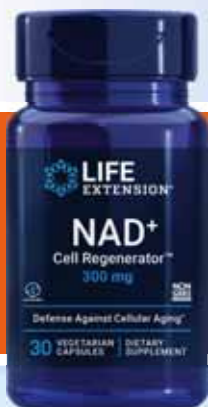
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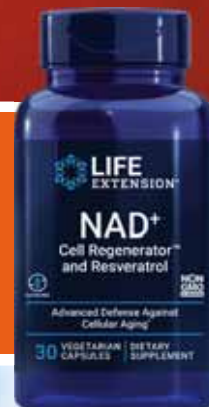
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A Silent Disorder Goes Epidemic



WILLIAM FALOON

In **1999**, I reviewed an article for publication in this magazine that described a **liver disease** that I had not heard of.

The authors told me this “**silent**” disorder would lead to widespread illness and premature death.

Move forward 20 years, and **nonalcoholic fatty liver disease** has emerged as the leading cause of chronic **liver disease**.¹

The underlying culprits are **obesity** and **insulin resistance**.^{2,3}

In **1980**, obesity was rare in the United States, affecting only **13%** of adults according to some reports.⁴

In the most recent study period (**2017-2018**), a startling **42.4%** of American adults were **obese**.⁵

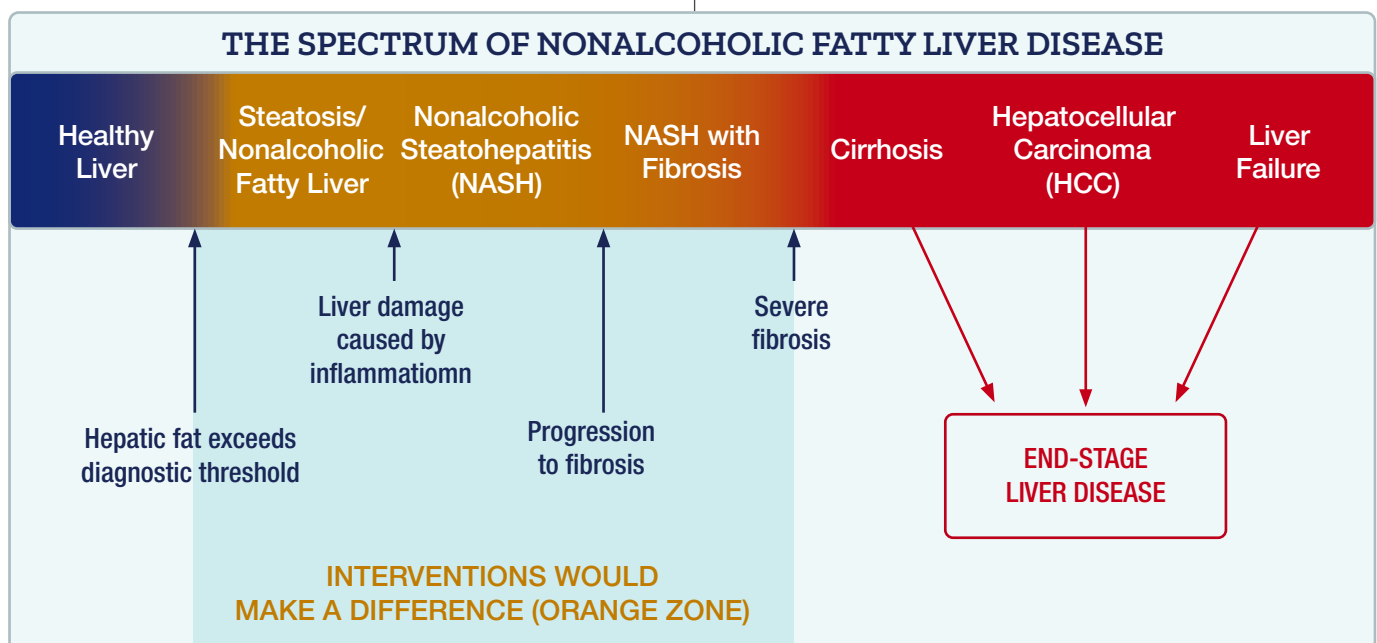
Nonalcoholic fatty liver disease afflicts up to **75%** of **overweight** adults, approximately **75%** of **type II diabetics**, and about **90%** of **obese** individuals.^{2,6}

People with **nonalcoholic fatty liver disease** are seeking our assistance in combating its multiple morbidities.

The most effective treatment for early-to-mid-stage **nonalcoholic fatty liver disease** (NAFLD) is **weight loss**.⁷ Adjuvant approaches can also help.

Once NAFLD fatty liver disease advances to **cirrhosis**, the only long-term treatment option is a **liver transplant**.⁸

An article in this month’s issue describes ways to help protect **liver health**.



Nonalcoholic fatty liver disease or NAFLD begins when excess **fat** accumulates in liver cells. Over time, it can progress to advanced **fibrosis** and **cirrhosis**.⁹

As the condition is generally asymptomatic or has very mild symptoms initially, many people do not know they have it unless a **blood test** detects abnormal levels of **liver enzymes**.

When detected in time, **NAFLD** is a reversible condition, meaning those afflicted can avoid progressing to advanced-stage disease that requires a liver transplant.¹⁰

Fatty Liver Disease and Cancer

Liver failure is the most common manifestation of advanced nonalcoholic fatty liver disease (NAFLD).⁶

Another NAFLD risk is **primary liver cancer** called **hepatocellular carcinoma**.¹³ Five-year survival for this malignancy is less than **20%**.¹⁴

A study published in **2018** evaluated 296,707 **NAFLD** patients and compared them with 296,707 matched **controls**. (This is a huge number of people to evaluate.)

This study found a more than **7.6-fold higher** risk of **hepatocellular carcinoma** among **NAFLD** patients compared to controls.¹⁵

NAFLD patients with **cirrhosis** had an even greater incidence of **hepatocellular carcinoma**.

A medical-record review from this study found that approximately **20%** of **NAFLD** patients with **hepatocellular carcinoma** had no evidence of **cirrhosis**.

This finding reveals **hepatocellular carcinoma** (HCC) risk in **NAFLD** patients who have not advanced to late-stage (cirrhosis) liver disease.¹⁵

This means people can skip past cirrhosis of the liver and develop primary liver cancer.

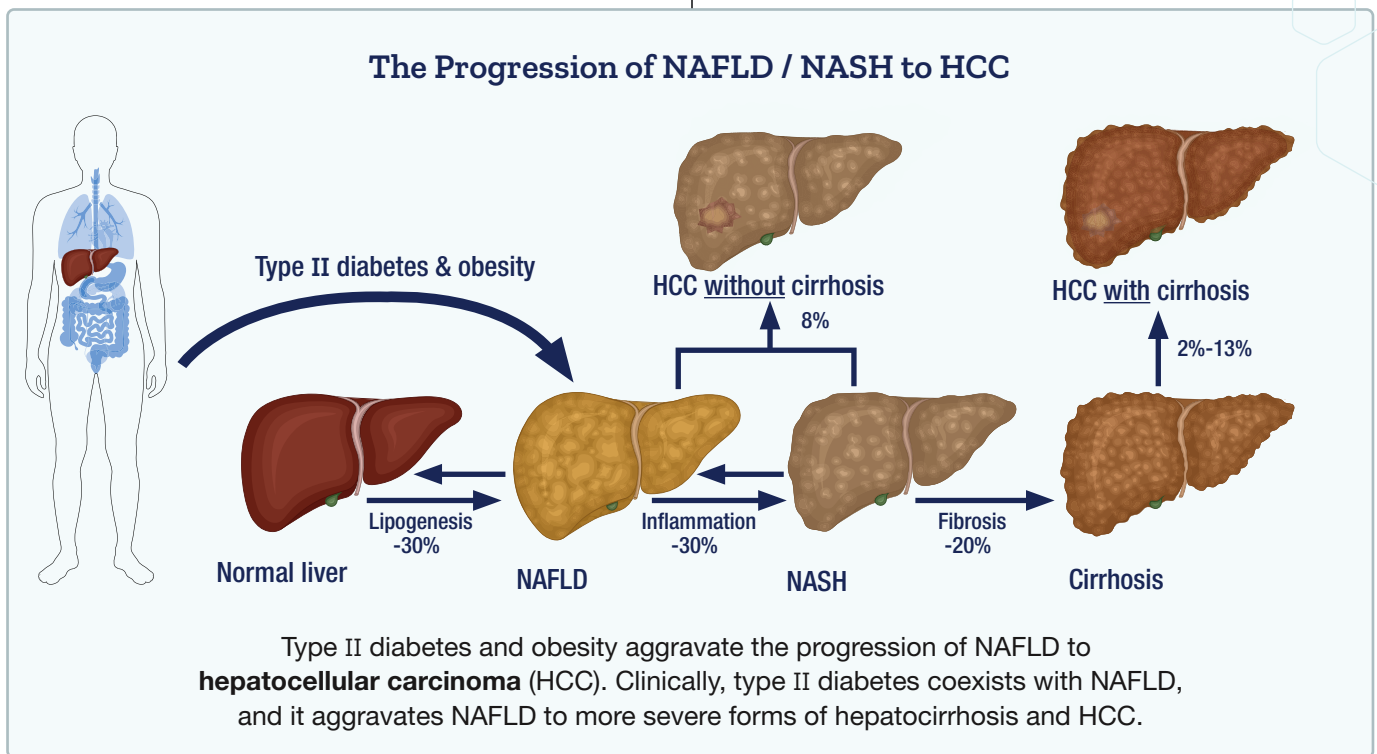
Diagnosing NAFLD

If you have a history of *any* of the following medical conditions you are at much greater risk of having some degree of **NAFLD**:⁶

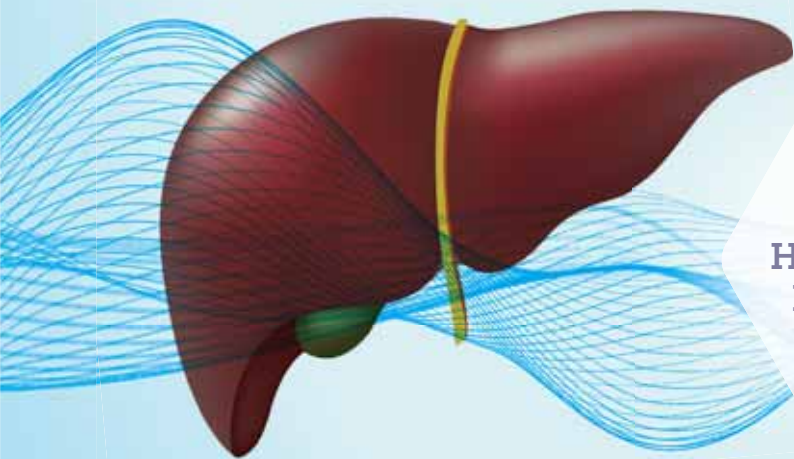
- **Excess body weight (abdominal obesity)**
- **Insulin resistance or type II diabetes**
- **Metabolic syndrome**

Most patients with NAFLD, especially early in the disease, are **asymptomatic**, and are only identified when their disease becomes advanced.

Abnormal liver test results are frequently the earliest evidence of NAFLD, which emphasizes the value of routine laboratory testing to identify asymptomatic NAFLD patients.



THE PROGRESSION OF NAFLD / NASH TO HCC BY MDPI, BASEL, SWITZERLAND CC BY 4.0



The Human Liver

More than 500 Vital Functions

Destroys Old Red Blood Cells

Detoxes Blood

Processes Nutrients

Regulates Blood Composition

Breaks Down Alcohol & Medications

Produces Proteins & Cholesterol

Produces Bile

Essential Liver Functions

More than **500** processes require healthy liver function, such as:¹¹

- Making bile to carry away waste, break down fats during digestion
- Producing albumin and other blood plasma proteins
- Converting excess glucose into glycogen for storage
- Making proteins to carry fats through the body
- Balancing blood glucose levels
- Regulating blood levels of amino acids
- Processing hemoglobin
- Converting poisonous ammonia to urea
- Clearing the blood of drugs and other toxic substances
- Regulating blood clotting
- Resisting infections by making immune factors and removing bacteria from the bloodstream
- Clearing bilirubin

In advanced liver disease, when **liver function** is **impaired**, the result is systemic havoc that may manifest as fatigue, abdominal pain, and fluid accumulation, along with increased **cardiovascular** and **diabetic** risks.¹²

In particular, the **liver enzymes** alanine aminotransferase (ALT) and aspartate aminotransferase (AST) can be elevated in up to **50%** of patients with **NAFLD**.¹⁶

Triglycerides can also be elevated in NAFLD but may not be in the early course of disease.

These three screening tests (ALT, AST, and triglycerides) are included in **Life Extension®'s** comprehensive **CBC/Chemistry Panel** for only **\$35**.

The **CBC/Chemistry Panel** can be ordered 24-hours a day by calling **1-800-208-3444** or logging on to: www.LifeExtension/blood

Most of you live close to a drawing station so you can walk in for the **CBC/Chemistry Panel** at your convenience. Fast for eight hours before your blood draw.

Diagnosing Advanced Liver Disease

Symptoms of advanced NAFLD and cirrhosis can include loss of appetite, pain in the upper right abdomen, fatigue, muscle loss, and/or fluid accumulation in your belly (ascites).¹⁷

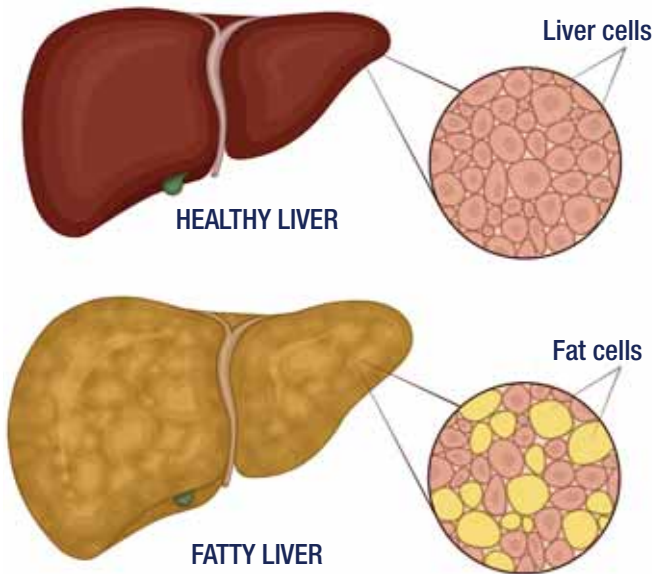
A physician's exam can reveal an enlarged liver, spleen, and other clinical signs with advanced NAFLD.

There are a variety of **imaging** (MRI, ultrasounds, CT) and advanced **blood tests** that can detect suspicious liver abnormalities. These diagnostic tests are often useful to identify the degree of fatty liver damage.

One such blood test for those at risk is called **NASH FibroSure**. It is designed to assess what degree of liver damage has occurred.

The cost of this blood test is a prohibitive **\$595**. For those with symptoms/signs of NAFLD, it might be best to have your physician prescribe this test and hopefully have it covered by your health insurance.

Nonalcoholic Fatty Liver Disease



For definitive diagnosis, liver biopsies can establish the stage, and degree of structural damage in patients with **NAFLD**.

Reversing Damage Caused by NAFLD

If caught in time, healthy dietary and lifestyle choices can stop and help reverse fatty accumulation in your liver cells.

The single most effective way to control or reverse NAFLD is **weight loss**.

Those who wait for **NAFLD** to reach advanced stages have few treatment options beyond being placed on a **liver transplant** waiting list.

Prevention remains the most effective strategy!

For longer life,

William Faloon, Co-Founder
Life Extension®

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In the News



Greater Vitamin C Intake Linked to Lower Cancer Risk

A comprehensive review that included 57 meta-analyses evaluating the association between **vitamin C** consumption and cancer found that *higher* intake of the vitamin was linked to a *lower* risk of many cancers, according to an article published in *Frontiers in Nutrition*.*

When digestive system cancers were evaluated, the *highest* intake of **vitamin C**, compared to the lowest, was associated with a **42%** decrease in the risk of esophageal cancer, a **34%** lower risk of stomach cancer and a **30%** lower risk of pancreatic cancer.

Additionally, among individuals whose vitamin C intake was highest, lung cancer risk was **17%** lower than in the group with the lowest intake.

Editor's Note: "Vitamin C consumption was associated with lower incidence of...total cancer occurrence," the authors stated.

* *Front Nutr.* 2022 Jan 20;8:812394.

Vitamin D Supplementation Reduces Palliative Cancer Patients' Need for Opioids

A *reduced* need for pain relief as well as *less* cancer-related fatigue were found in palliative cancer patients receiving supplemental **vitamin D**, compared to a placebo group, the journal *Cancers* reported.*

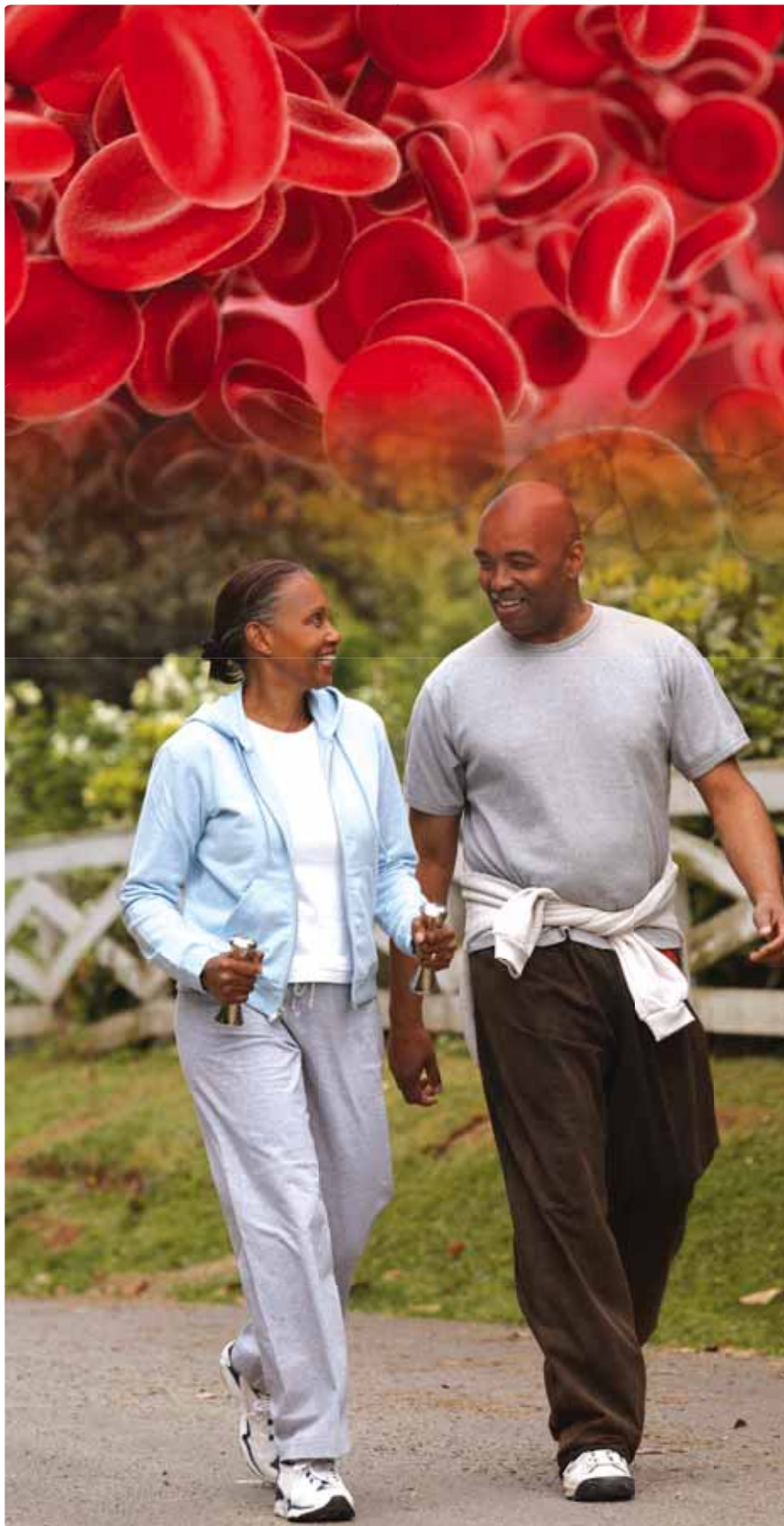
At the start of the double-blind, randomized placebo-controlled study, 244 cancer patients, all *deficient* in vitamin D, were given either high-dose vitamin D (**4,000 IU/day**) or a placebo for 12 weeks. Their opioid doses were assessed throughout the 12 weeks as a measurement of pain.

Those taking vitamin D had significantly lower increases in opioid doses during the study. This indicates a **reduced need for pain relief**. They also reported less cancer-related fatigue compared to the placebo group.

Editor's Note: "Correction of vitamin D deficiency may have positive effects on pain and fatigue in palliative cancer patients," the researchers concluded.

* *Cancers*. 2021; 13 (15): 3707.





Higher CoQ10 Levels Benefit Older Folks

A study found greater physical capacity and a reduction in blood factors related to cardiovascular disease among participants with *higher* plasma levels of CoQ10, a factor in the production of energy within the mitochondria of the cells, according to an article in *Antioxidants (Basel)*.*

Participants included men and women aged 65 and older, with a majority being women.

Higher CoQ10 levels were significantly associated with lower cardiovascular disease risk. Having greater levels of CoQ10 also correlated with better physical activity.

Authors suggest the combination of CoQ10 with physical activity as an important therapy for the prevention of **sarcopenia** and the maintenance of physical capacity.

Editor's Note: "It is probable that supplementation with CoQ10 could improve physical capacity in addition to the known effects in the cardiovascular system. These relationships suggest that CoQ10 could be considered an important component for maintaining independence and health in aged individuals," the authors stated.

* *Antioxidants (Basel)*. 2022 Jan 29;11(2):279.

Light to Moderate Coffee Drinking Can be Good for You

The *European Journal of Preventive Cardiology* published the largest observational study to date showing that drinking coffee was associated with a reduced risk of all-cause mortality, cardiovascular mortality, and stroke.*

For 11 years, researchers tracked data from 468,629 individuals who did not have heart disease at the start of the study.

Compared to non-coffee drinkers, light-to-moderate drinkers (**0.5-3 cups** per day) were found to have **12%** lower risk of all-cause mortality, **17%** lower risk of dying from cardiovascular disease, and **21%** reduction in the incidence of stroke.

Editor's Note: The researchers concluded that, "This favorable impact might be partly explained by lower Arterial Stiffness Index and subclinical alterations in cardiac structure and function."

* *Eur J Prev Cardiol.* 2022 May 6;29(6): 982-991.



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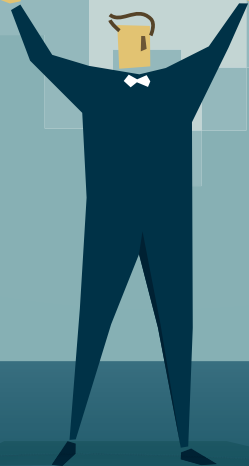
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A Brain-Specific
MAGNESIUM
Relieves Stress



BY STUART SANCHEZ

In a **2022** report, the **American Psychological Association** noted that **73%** of U.S. adults say they feel “*overwhelmed by the number of crises facing the world right now.*”¹

Chronic stress has been linked to:^{2,3}

- Anxiety and depression
- Cardiovascular disease
- Obesity
- Menstrual problems
- Sexual dysfunction
- Gastrointestinal problems
- Hair and skin conditions

People suffering from **stress-related** symptoms, depression, or anxiety often have low blood levels of **magnesium**.⁴

In a follow-up analysis of a clinical study, it was found that approximately **44%** of participants screened for stress were **magnesium deficient**.⁵

Preclinical studies found that a specific form of magnesium called **magnesium acetyl taurate** *increased* brain tissue levels of magnesium more effectively than other forms of magnesium tested.^{6,7}

Magnesium acetyl taurate was recently tested in women with **premenstrual syndrome** over a duration of three menstrual cycles, who had inadequate magnesium intake from food.⁸

Researchers found improved scores for **symptoms of stress** including nervous tension, anxiety, irritability, headache, fatigue, and depression in women supplementing with **magnesium acetyl taurate** twice daily.

The Magnesium-Stress Connection

Decades ago, researchers first noticed a link between **magnesium** and **stress**.^{9,10}

Many of the frequently-reported symptoms of **stress**—fatigue, irritability, anxiety, headache, and upset stomach—are the *same symptoms* commonly found in patients with **magnesium deficiency**.⁴

As scientists explored the connection, they discovered that it goes both ways:^{4,11}

- The body's responses to stress lead to a *loss* of magnesium in the urine, over time creating a magnesium deficiency.
- *Low* magnesium levels make people *more* susceptible to stress, increasing release of stress hormones like **adrenaline** and **cortisol**, which can be harmful if their levels remain elevated.

This can create a **vicious circle**. As *low* magnesium levels make the effects of stress more severe, that further reduces magnesium levels, making people even more susceptible to stress, and so on.⁴

On the other hand, maintaining **adequate magnesium** levels helps protect against stress and other conditions.

Magnesium is an important cofactor for the synthesis of **serotonin**, a neurotransmitter closely linked to positive

mood and feelings of **calm**. Most antidepressant and anti-anxiety medications act at least partially by modulating serotonin neurotransmission.^{4,11}

Magnesium can also inhibit release of the stress hormone cortisol from the adrenal gland.¹²

Unique Brain-Targeted Magnesium

Scientists identified a specific form of magnesium that, taken orally, can rapidly increase **brain levels** of magnesium.

Magnesium acetyl taurate is magnesium combined with a form of the amino acid **taurine**. The combination makes it easier for the magnesium to cross the blood/brain barrier.

Studies have found that this form of magnesium was more easily **absorbed** into the **brain** than the other forms of magnesium tested.

In one study, rats were given either **magnesium acetyl taurate** or two other common forms of magnesium, magnesium sulfate and magnesium oxide.⁶ Brain tissue and blood magnesium levels were significantly higher after eight hours in the group receiving **magnesium acetyl taurate**.

Another preclinical study pitted **magnesium acetyl taurate** against four other common forms of magnesium: magnesium sulfate, oxide, citrate, and malate.⁷





WHAT
YOU
NEED
TO
KNOW

Relief for Stress and Anxiety

- Chronic stress is associated with **cardiovascular disease**, obesity, anxiety, depression, and more.
- The close link between stress and **magnesium** in the body has gained interest by researchers. Having low magnesium levels increases susceptibility to stress and its negative health consequences.
- One specific form of magnesium, **magnesium acetyl taurate**, was found to be superior to other forms tested in raising brain levels of magnesium.
- In a human study, taking **385 mg** of **magnesium acetyl taurate** twice daily reduced premenstrual syndrome symptoms that are similar to those of stress, including anxiety, irritability, headache, fatigue, and depression.

Again, brain levels of magnesium were significantly *higher* in the group receiving **magnesium acetyl taurate** than with control or *any* of the other forms of magnesium tested.

This study also found that **magnesium acetyl taurate** was associated with decreased **anxiety** indicators in rodents.

This form of magnesium has also shown promise in an early study in **humans**.⁹

Easing Stress

Researchers enrolled adult women with symptoms of **premenstrual syndrome** who had inadequate magnesium intake in their diet.⁸ Premenstrual syndrome can cause symptoms similar to those of **stress**.

After receiving **385 mg** of **magnesium acetyl taurate** twice daily over a series of three consecutive menstrual cycles, scores for numerous symptoms were significantly reduced, including those for nervous tension, anxiety, irritability, headache, fatigue, and depression.

Intake of this form of magnesium may promote calm and help people cope with symptoms of stress and anxiety, whatever the cause.



The Importance of Magnesium

Magnesium is an important essential mineral in the body.^{4,5}

It is involved in most major metabolic and biochemical processes and serves as a **cofactor** (“helper molecule”) for more than **300** different enzymatic reactions.^{4,5}

Low magnesium has been tied to numerous health problems, including cardiovascular disease, diabetes, osteoporosis, depression, and anxiety.^{11,13}

Suboptimal levels of magnesium are more common than most people realize.

It has been estimated that **64%** of all men and **67%** of women in the U.S. have inadequate dietary intake of magnesium. More than **80%** of people over the age of 71 have an inadequate dietary intake of magnesium.¹⁴

Making matters worse, excessive sodium intake, high alcohol and caffeine intake, and some medications (including **proton pump inhibitors** for acid reflux) can further contribute to lower magnesium levels.⁴

Summary

Chronic **stress** can be extremely harmful, increasing the risk cardiovascular disease, obesity, and other conditions.

The close link between stress and levels of **magnesium** in the body has sparked the interest of researchers.

A specific form of magnesium called **magnesium acetyl taurate** improves the bioavailability of magnesium and was found to be more effective at raising brain levels of this essential mineral than the other forms of magnesium tested. •

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

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1. *Sleep Med Rev.* 2005 Feb;9(1):41-50. 2. *Lancet.* 1995 Aug 26;346(8974):541-4. 3. *Neurol Res.* 2017 Jun;39(6):559-65.

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References: 1. *Nutrients*. 2020 Nov 28;12(12).
2. Synapharm - Company supplied data. 2021.

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Cancer-Fighting Properties of **CRUCIFEROUS VEGETABLES**





BY STEPHEN RAMON

The anti-cancer effects of **cruciferous vegetables** like **broccoli** have long been researched.

Studies show that *higher* intake of these **vegetables** is associated with a reduced risk of many cancers.^{1,2}

Two established cancer-fighting plant compounds found only in **cruciferous vegetables** are:

SULFORAPHANE
and
DIM (3,3'-DIINDOLYLMETHANE)

Research suggests these plant compounds target **six** different **pathways** to impede the development of cancer and slow progression of existing cancer.

DIM is readily **bioavailable** to the body, but it is challenging to obtain **sulforaphane** from mature broccoli.

This article updates readers on the cancer-fighting properties of **sulforaphane** and how to deliver it to the small intestine for *systemic absorption*.

Benefits of Cruciferous Vegetables

The **cruciferous vegetables** include:

- **Broccoli**
- **Cabbage**
- **Cauliflower**
- **Kale**
- **Brussels sprouts**
- **Collard greens**
- **Bok choy**
- **Arugula**
- **Watercress**
- **Radishes.**

Vegetables in this family contain a wide range of nutrients, including flavonoids, carotenoids, and minerals.^{3,4}

Dietary intake of **cruciferous vegetables** like broccoli and cauliflower has been demonstrated to reduce cancer risk.⁵⁻⁷

High intake of **cruciferous vegetables** is also associated with better survival rates in patients already diagnosed with cancer.^{8,9}

Two unique compounds present in the cruciferous family, **sulforaphane** and **DIM (3,3'-diindolylmethane)**, modulate pathways involved in cancer development and progression.¹⁰⁻¹³

They work in multiple ways to block the development of cancer *and* to make it difficult for cancer cells to grow and survive.

Promising Sulforaphane Studies

A study published in **2021** evaluated the effect of **sulforaphane** on human **glioblastoma** cells.¹⁴ Glioblastoma is an aggressive cancer of the brain or spinal cord that is often incurable.

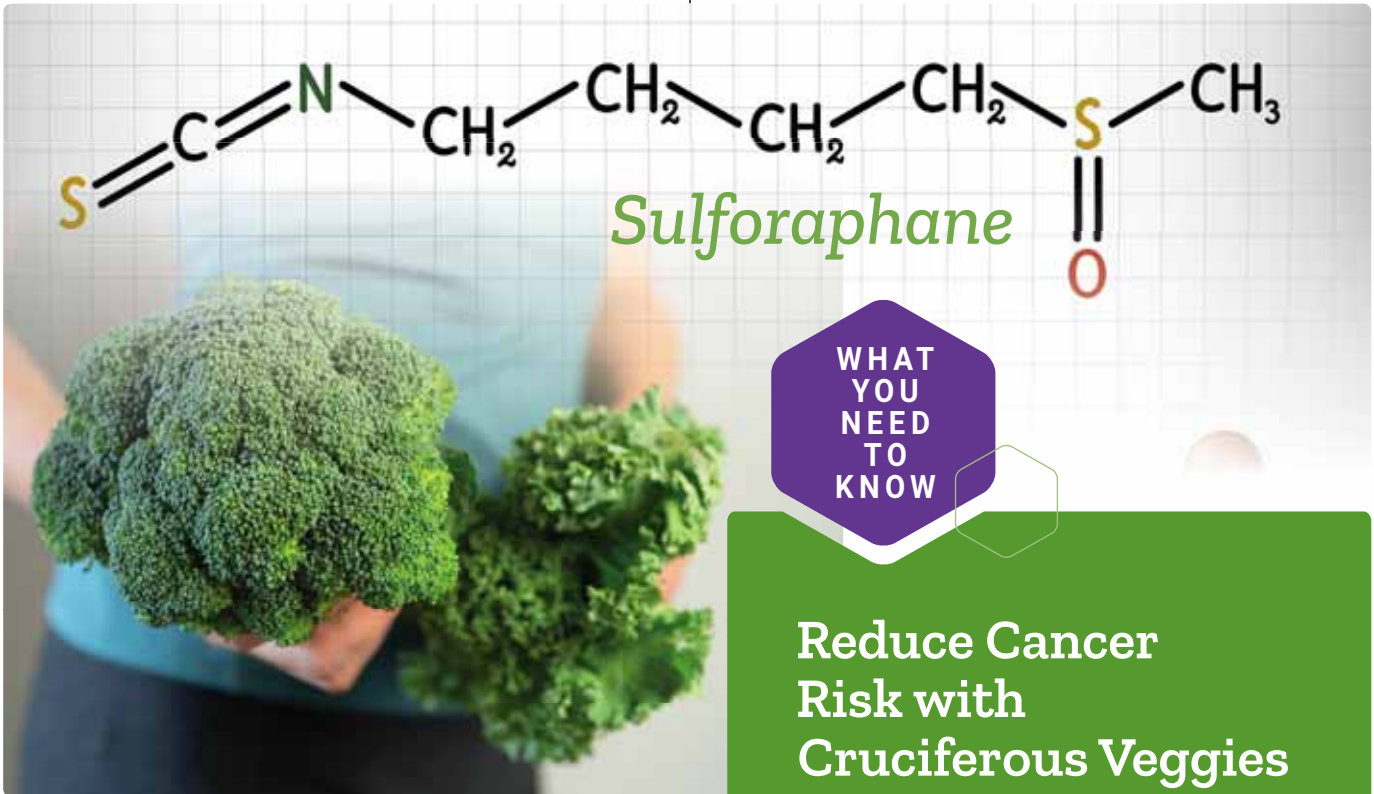
Sulforaphane ***stopped the growth of cancer cells*** in their tracks. It also caused the cancer cells to begin to ***die off***.

Similar results have been seen in other human cancer cell lines, including **prostate** and **breast** cancers.¹⁵⁻²¹

Sulforaphane has shown promise in animal studies as well.²² In one, rats were given a potent carcinogen. In the group of animals that did *not* receive sulforaphane, **68%** developed tumors.

In rats given **sulforaphane**, just **39%** developed tumors. And in treated rats that *did* develop tumors, the tumors were smaller *and* slower growing.





WHAT
YOU
NEED
TO
KNOW

Reduce Cancer Risk with Cruciferous Veggies

- **Cruciferous vegetables** include broccoli, cabbage, kale, cauliflower, Brussels sprouts, and more. Studies show that diets high in these vegetables protect against many forms of **cancer**.
- Two nutrients derived *only* from cruciferous vegetables have been shown to possess potent cancer-fighting abilities: **sulforaphane** and **DIM (3,3'-diindolylmethane)**.
- These compounds limit the ability of cancer cells to grow, divide, and spread, and they cause cancer cells to die off.
- **Sulforaphane** is unstable. Scientists have solved this problem by packaging a sulforaphane precursor with an enzyme that only converts it into sulforaphane *in the body*. That way it can be rapidly absorbed in the digestive tract.

One recent study indicates that **sulforaphane** may be effective when used alongside certain conventional anti-cancer drugs.

Scientists tested **stomach cancer** cells, some of which were sensitive to the anti-cancer drug **lapatinib** and some which were resistant to the drug.²³

Combining **lapatinib** and **sulforaphane** stopped the growth and spread of *both* types of cancer and killed off the cells—even cells previously **resistant** to the drug.

Improving the Delivery of Sulforaphane

Sulforaphane is an unstable compound that rapidly degrades into non-active substances if it isn't quickly **absorbed** or if the vegetable is cooked. Interestingly, it isn't even present in cruciferous vegetables themselves.

Instead, a precursor called **glucoraphanin** is stored inside the cells of these plants. In a separate compartment in these cells there is an *enzyme* called **myrosinase**.

When these two are combined, the **myrosinase** converts the **glucoraphanin** into **sulforaphane**.

This is what happens when the vegetable is eaten **raw**. During digestion, sulforaphane is formed. Then, before it degrades, it can be absorbed within the small intestine.^{2,5,24}



But maximizing these anti-cancer benefits would require the consumption of massive amounts of raw cruciferous vegetables or cruciferous sprouts.

The challenge for scientists was to find a way to deliver **glucoraphanin** and **myrosinase** separately to the small intestine.

One group of scientists came up with an ingenious solution that copies nature.

They isolated **glucoraphanin** and **myrosinase** from broccoli, then developed a unique delivery system that keeps them separate, *just the way plants do*.

A dual-layered tablet was given an enteric coating to prevent its ingredients from being released until it reaches the small intestine.

With this delivery system, the compound **glucoraphanin**, and the enzyme **myrosinase** meet and mix in the small intestine. There, they come together to create **sulforaphane**, just as nature planned.

The results have been striking. Research at the Johns Hopkins University School of Medicine demonstrated that **sulforaphane** levels from this **glucoraphanin-myrosinase** mix are **three to four times** more bioavailable (absorbable) than those created by glucoraphanin supplementation alone.²⁵

Six Anti-Cancer Mechanisms

DIM and **sulforaphane** act in **SIX** different ways to help prevent the development of cancer and to slow the spread of existing cancer.

IMPEDING CANCER CELL GROWTH

Both compounds can arrest the **cancer cell cycle**, interfering with the ability of tumor cells to grow.^{14-17,19,21}

They also block the formation of new blood vessels in tumors, starving them of nutrients and oxygen.^{16,26-28}

Type 2 transglutaminase is a cancer cell survival protein in several forms of cancer. A study published in **2022** showed that **sulforaphane** attaches itself to this protein, *blocking* its activity.²⁹ This further shuts down cancer cells' ability to survive.

KILLING OFF CANCER

When normal cells become damaged, they're supposed to die off through a process known as **apoptosis** (programmed cell death).

Many cancer cells evolve to *shut off* apoptosis. **DIM** and **sulforaphane** have been found to turn apoptosis *back on*, initiating **cancer cell death**.^{16,18,20}

REDUCING HARMFUL EPIGENETIC CHANGES

Cancer can also be caused by **epigenetic** changes, which happen when genes are turned “on” or “off,” making them active or inactive.

Both sulforaphane and DIM **reduce epigenetic changes** that contribute to tumor development.^{11,30-32}

STIMULATING CELLULAR PROTECTION

Nrf2 is a protein that regulates **cellular protection**. *Activating* Nrf2 turns on different genes that protect cells against stress and injury.³³

For example, Nrf2 activates enzymes that help eliminate **mutagens** and other toxins.^{34,35}

Many of sulforaphane’s benefits stem from its activation of the Nrf2 pathway.³³

REDUCING CHRONIC INFLAMMATION

DIM and sulforaphane both inhibit the action of **nuclear factor-kappa B (NF-kB)**, a regulatory protein that contributes to chronic inflammation.³⁶⁻³⁸

This **anti-inflammatory** effect helps prevent cancer and other chronic health conditions.



FIGHTING HORMONE-DRIVEN CANCER STIMULATION

Some **prostate** and **breast cancers** are stimulated by forms of **estrogen**. DIM shifts estrogen balance away from an estrogen form that promotes tumor cell growth and toward a form that **inhibits** it.^{39,40}

In women with a history of **breast cancer**, daily DIM intake increased the proportion of “good” estrogen and reduced the forms linked to faster cancer progression.^{39,40}

In men, higher estrogen levels are associated with prostate enlargement and cancers. In a cell study, DIM prevented estrogen-induced stimulation of prostate cancer cells.⁴¹

Summary

Many studies show that *higher* intake of **cruciferous vegetables** protects against **cancer**.

These vegetables are a source of two compounds that have demonstrated strong anti-cancer activity: **DIM (3,3'-diindolylmethane)** and **sulforaphane**.

Both compounds can stop cancer cell development and growth in their tracks.

Sulforaphane intake has previously been problematic because it is so unstable. A novel two-layer formula enables the nutrient to be bioavailable for **absorption** into the bloodstream. ●

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

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BANISH CONSTIPATION



and ITS HEALTH RISKS

BY MICHAEL DOWNEY

No one likes to talk about it, but about **15%** of Americans experience **constipation** on an ongoing basis. It can be unpleasant and uncomfortable.

Constipation increases with age, affecting approximately **34%** of women and **26%** of men 65 years and older.¹

The risks go well beyond discomfort.

A 2019 study found that constipation is associated with a higher risk of **stroke, coronary heart disease, and all-cause mortality**.²

Changes to the gut microbiota associated with constipation might be related to **atherosclerosis, a rise in blood pressure, and cardiovascular events**.³

There's a unique way to counter those changes: a targeted **probiotic** strain that reduces constipation.⁴

For those who need immediate relief combinations of **magnesium + vitamin C** or **potassium + magnesium + vitamin C** are effective while providing the body with healthy nutrients.



Health Issues Linked to Constipation

Constipation can make life miserable. It's associated with a higher risk of heart disease, stroke, and overall mortality, as well as to a disrupted microbiota that may have negative effects throughout the body.^{2,6}

Constipation is also linked to a higher risk of **cancer**. This may be due to increased inflammation or prolonged contact between **stool carcinogens** and the tissue lining the colon.⁵

A Probiotic Solution

Scientists focused on the beneficial bacteria known as **probiotics** as a possible solution.

After investigating more than **2,000** probiotic strains, scientists identified several strains derived from **yogurt** produced in New Zealand that had **probiotic** value *and* the ability to survive conditions similar to those in the human digestive tract.⁷

Of these, one **specific strain** *decreased colonic transit time*, the time it takes for food to move through the colon. This probiotic is ***Bifidobacterium lactis* HN019**.⁴

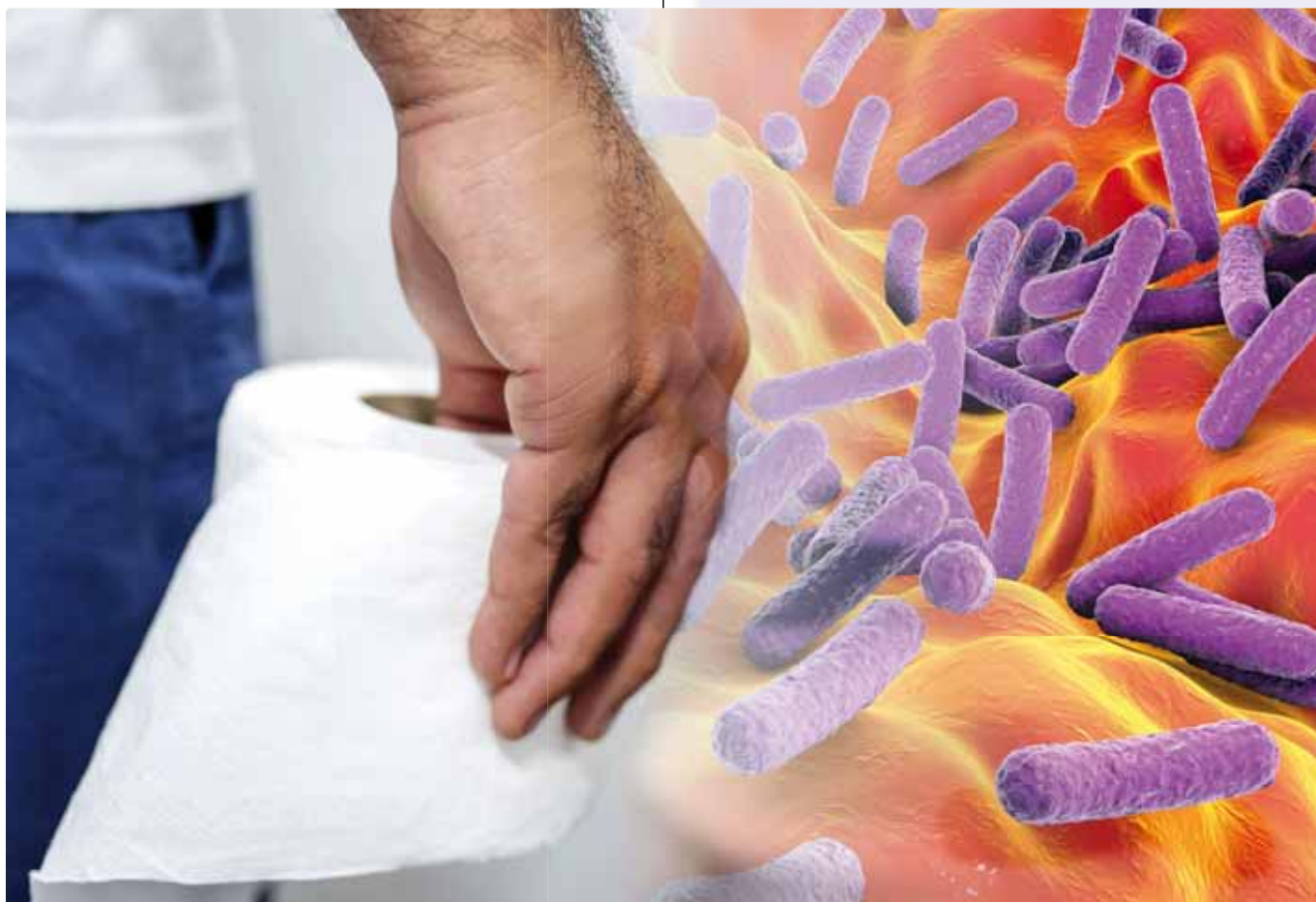
By moving stool along **faster**, scientists believed that this probiotic could help relieve existing constipation *and* many symptoms often associated with it, such as abdominal pain and gas.⁴

Clinical Study of Constipation

In a clinical trial of patients with **moderate constipation**, daily use of a unique **probiotic** for two weeks led to a:⁴

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

In addition to restoring regularity, this probiotic could help **prevent** some of the long-term health effects associated with constipation.





WHAT
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Impressive Clinical-Trial Results

To validate their hypothesis, scientists set out to test *B. lactis* HN019 in a clinical trial.⁴

A total of 88 men and women ages 25 to 65 were divided randomly into three groups:⁴

- One group took **1.8 billion** colony-forming units (CFU) of *B. lactis* HN019 once daily,
- Another took **17.2 billion** CFU of *B. lactis* HN019 once daily, and
- A third group took a daily placebo.

After **14 days**, compared to the placebo group:⁴

- Those who took the lower *B. lactis* dose had colonic transit times that were **18.5 hours** faster, an improvement of **31%**.
- Those who took the higher daily dose of **17.2 billion** CFU of *B. lactis* had colonic transit times that were **28.1 hours** faster, an improvement of **57%**.

Safe, Quick Constipation Relief

- Scientists have identified a probiotic strain, *Bifidobacterium lactis* HN019, that relieves ongoing constipation—without side effects.
- In a clinical trial, oral use of *B. lactis* HN019 decreased **colonic transit time** by up to **57%**, eased nausea and abdominal pain, and effectively restored normal bowel regularity in just **two weeks**.
- In addition to reducing quality of life, **chronic constipation** may be associated with serious health issues, including higher rates of heart disease, cancer, and all-cause mortality.

For Immediate Relief

Life Extension long ago published a solution for **constipation** caused by insufficient **peristalsis**.

The term peristalsis refers to a series of organized muscle contractions that moves food through the digestive tract.¹⁵

Insufficient or **ineffective peristalsis** means there is not enough colon contractile activity, or the activity does not occur in the necessary rhythmic pattern needed to completely evacuate one's bowels.

The encouraging news is that if one **drinks** the proper **nutrient mix** on an **empty** stomach (usually first thing in the morning), a **surge of peristalsis** will occur within an hour that cleans out most or all fecal matter.

The most popular nutritional powders used for this purpose contain vitamin C with magnesium and/or potassium.

It is important to **drink at least one to two glasses of water (8 to 16 ounces)** after taking

these powdered nutrient mixes as they will draw water from surrounding tissues into the colon to facilitate passage of feces.

By increasing the volume of **water** in the intestine in combination with **nutrients** that stimulate peristalsis, stools are softened, intestinal muscle contraction is stimulated, and bowel evacuation is prompted.

The most popular formula our customers use is a low-cost effervescent buffered blend comprised of **vitamin C + magnesium + potassium**.

Those with **chronic kidney disease** should not take the high doses of magnesium and potassium used to stimulate peristalsis. This is especially relevant to those with advanced kidney disease (stages 3 and 4).

Maintaining sufficient intake of **magnesium** and **potassium**, however, is critical for all individuals.

Subjects taking the *higher* dose improved their slower-than-normal colonic transit times into the **normal range**—within just **two weeks**.

Digestive discomfort questionnaires completed by the participants showed that in the *higher-dose* probiotic group the symptom frequency was, on average:⁴

- For constipation, decreased **42%**,
- For abdominal pain, decreased **52%**, and
- For nausea, decreased **48%**.

Taking this probiotic did not result in any adverse effects.⁴

How the Probiotic Works

Studies have provided insight into *how* **B. lactis HN019** may be able to reduce colonic transit time.^{4,8,9}

Certain types of bacteria in the digestive tract act on food in the digestive tract, producing **short-chain fatty acids**, which are a source of **energy** for cells lining the colon. These fatty acids are essential to optimal gastrointestinal health.

Preclinical models have demonstrated that short-chain fatty acids interact with a protein within certain cells that exist alongside intestinal **epithelial** (surface) cells. This sets in motion a cascade of events that speeds up **colonic transit times**.^{4,9-11}

A clinical study also revealed that use of *B. lactis* HN019 *increased* levels of two other beneficial bacteria, **bifidobacteria** and **lactobacilli**, and *decreased* levels of harmful **enterobacteria**.¹²

The net result of this gut microbiota rebalancing may be stimulation of **peristalsis** (the muscle contractions that move food through the digestive tract) and a shortening of colonic transit time.⁴

More Effective than Constipation Drug

Scientists at **Life Extension** compared this probiotic's clinical results to those of a prescription constipation medication called **prucalopride**.

They reviewed multiple clinical studies of prucalopride.¹³

Reviewers found that **prucalopride** improved colonic transit times by **20%**,¹³ far *less* than the **57%** improvement seen in the high-dose **B. lactis HN019** trial.⁴

Prucalopride has been associated with multiple **side effects**, including headaches, abdominal pain, nausea, and diarrhea,¹⁴ compared to no adverse side effects with the probiotic.⁴

This probiotic strain shows greater effectiveness at relieving and preventing constipation than a major prescription drug. This can help prevent serious, **long-term health effects**.

Summary

Constipation afflicts about a third of people over **60**. Beyond the discomfort and unpleasantness, there is even some thought that constipation may have an association with heart disease, cancer, and other serious health risks.

Clinical research showed that taking the probiotic strain **Bifidobacterium lactis HN019** decreased **colonic transit time** by up to **57%**, safely restoring regular bowel movements *within two weeks*. •

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



Prescriptions for Constipation

In difficult cases of patients with **chronic idiopathic constipation**, an ongoing condition that does not seem to have a cause, doctors may prescribe either Trulance® or Linzess®. These drugs are **prosecretory agents** which release water into the intestines and reduce bowel transit time. Without insurance, these drugs can cost over **\$500** for a thirty-day supply.

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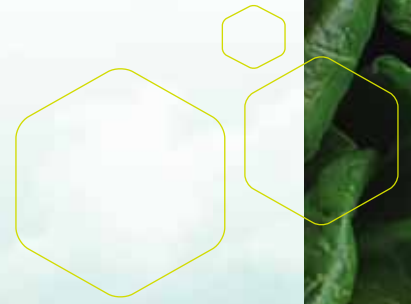
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VERIFIED CUSTOMER REVIEW



FISETIN

Promotes Brain Health





BY RICHARD REYNOLDS

Nutrients derived from **plants** have been shown to protect against changes in the **brain** that lead to neurological disorders.

In **2021**, two review articles identified **fisetin** as one of the most promising.^{1,2}

Preclinical studies show the potential of **fisetin** to reduce the impact of **stroke**, mild **cognitive impairment**, and **dementia**.^{1,2}

A Multifunctional Nutrient

The **flavonoids** are a group of **plant compounds** with health-promoting properties.

Fisetin is a flavonoid with **dozens of biological mechanisms** that support neurological health.²

Fisetin is found in many fruits and vegetables, but only in very small amounts. Most commercially available oral fisetin has poor **bioavailability**.³

Scientists have overcome this problem by coating the fisetin in a form of fiber found in the **fenugreek** plant.

This helps protect the fisetin from getting broken down, leading to about **25 times more fisetin** being absorbed into the body.⁴

Promise for Neurological Conditions

In pre-clinical studies, **fisetin** has shown promise for a range of **neurological disorders** that include:^{1,2}

- Alzheimer's disease,
- Brain aging and cognitive decline,
- Stroke,
- Neurological complications of diabetes,
- Depression,
- Traumatic brain injury,
- Parkinson's disease,
- Huntington's disease,
- Amyotrophic lateral sclerosis (ALS),
- Neurotoxicity (damage to the nervous system caused by toxins),
- Schizophrenia,
- Vascular dementia, and
- Other forms of neurodegenerative disease.

Additionally, in a **clinical trial**, fisetin improved response to treatment in **ischemic stroke**.⁵

Fighting Against Neurological Disease

A review published in 2021 found that **fisetin** modulates **37** different biological pathways.²

All these actions could reduce the risk and severity of age-related neurological conditions.

Five ways that **fisetin** protects the **brain** and **nervous system** are:

1. PREVENTING TOXIC BRAIN DEPOSITS

The plaques and tangles deposited in the brain are made of toxic proteins called **beta-amyloid** and **hyperphosphorylated tau**. In preclinical models, fisetin *prevents* their accumulation.^{6,7}

In another study, fisetin increased **autophagy**, a form of cellular cleaning, which helps clear *existing* toxic proteins from brain cells.⁸

2. ANTIOXIDANT ACTIVITY

Oxidative stress is a significant contributor to neurological disorders.

Fisetin is a potent **antioxidant** that can scavenge harmful compounds *before* they do damage.¹



WHAT
YOU
NEED
TO
KNOW

It has been shown in preclinical models that fisetin increases intracellular levels of **glutathione**, a free-radical scavenger important for cell survival.⁹

3. REDUCED CHRONIC INFLAMMATION

Chronic inflammation contributes to most chronic disease in the brain.

In preclinical trials, two forms of fisetin blocked activation of **nuclear factor-kappa B (NF-κB)**, a master regulator of inflammation.^{10,11} This action prevents the release of pro-inflammatory compounds.

In a study in a particular strain of mice susceptible to Alzheimer's-type neurological degeneration, feeding them fisetin in early to mid-life prevented learning and memory decline.

Fisetin also limited levels of inflammatory compounds that are elevated in Alzheimer's disease and other neurodegenerative disorders.¹²

4. MEMORY AND LEARNING SUPPORT

A protein called **CREB** helps brain cells adapt to experiences over time, a process known as **long-term potentiation**.¹³ This is a critical component of memory formation.

Fisetin *increases* activation of CREB and enhances long-term potentiation in preclinical studies.¹³⁻¹⁵

5. BLOCKING GLYCATION DAMAGE

Glycation occurs when glucose attaches to proteins, DNA, and lipids, forming toxic compounds.

Damage caused by glycation has been associated with **cognitive dysfunction** and neurodegenerative diseases like **Alzheimer's disease**.¹⁶ **Glycated** beta-amyloid is even more damaging to brain function than non-glycated forms.¹⁷

In mice, **fisetin** was shown to *reduce* glycation and its damaging effects.¹⁸

Summary

The flavonoid **fisetin** acts in multiple ways that may help improve nervous system health and reduce risk for **neurological disorders**.

Two recent reviews amalgamate mostly preclinical evidence supporting fisetin's abilities.

These include the prevention or management of **neurological conditions** such as stroke, Alzheimer's, Parkinson's, and cognitive decline. ●



A Brain-Protecting Nutrient

- **Neurological disorders** were identified, as of 2016, as responsible for more disability than any other cause and were the second leading cause of death.
- **Fisetin** is a nutrient found in many fruits and vegetables in small amounts.
- Oral fisetin is rapidly metabolized. Combining it with fiber from fenugreek increases its bioavailability by about **25 times**.
- Preclinical research has shown that fisetin may have benefits for neurological conditions including stroke, Alzheimer's disease, Parkinson's disease, brain aging, and cognitive decline. A clinical study has also been completed and others are on the way.

A Potent Senolytic

The discovery of **senolytics** is one of the most important breakthroughs in the field of aging.

Senolytic compounds can *eliminate* aged **senescent cells** from the brain and body. These dysfunctional cells contribute to many conditions of older age, including neurodegenerative disease.¹⁹

Removing senescent cells improves tissue function, reduces risk for chronic disease, and **extends lifespan** in preclinical studies.²⁰⁻²²

In a panel of 10 flavonoids tested in mice genetically predisposed to rapid and premature aging, fisetin was the most potent senolytic.²³

Senolytics like fisetin hold promise in the fight against aging and age-related disease.

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

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

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"I believe this product is another arrow in my quiver of products I use to be my best."

Raymond

VERIFIED CUSTOMER REVIEW

Fisetin

The Longevity Flavonoid

Fisetin, a flavonoid found in strawberries and apples, is currently being studied for its effectiveness as a **senolytic** in humans.¹

In preclinical studies, fisetin:

- Mimics effects of **calorie reduction**²
- Targets longevity pathways²⁻⁶
- Extends lifespan of mice by about **10%**⁷
- Removes **senescent** cells through **senolytic** action⁷
- Suppresses excess **mTOR** activation⁸

Fisetin is poorly *absorbed* due to its breakdown in the small intestines.

Bio-Fisetin solves this problem by enclosing **fisetin** with a compound from the fenugreek herb.

A **human** trial showed **bioavailability** of this **fisetin** compound increased up to **25 times** compared to fisetin by itself.⁹

Just one capsule daily of **Bio-Fisetin** helps manage **senescent cells** and may support overall longevity.

Item #02414

30 vegetarian capsules

1 bottle **\$11.25**

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For full product description and to order **Bio-Fisetin**, 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.

2021 AGING CONFERENCES





BY BEN BEST

Research has increasingly been finding ways to reverse aging in laboratory animals, and much of this research could also benefit humans. Some age-reversal therapies are currently being used by self-experimenters.

During the last year or two, scientists have continued to work and think about solving problems to relieve the suffering caused by aging.

This article describes presentations by scientists at 2021 aging conferences which I found most inspiring.

Therapy for Cancer and Senescent Cells

Peter de Keizer, PhD (Associate Professor, UMC Utrecht University, Utrecht, Netherlands) is developing therapeutic interventions against cancer and senescent cells. **Senescent cells** are cells that cease to perform normal functions, but which produce chemicals (cytokines) that induce chronic inflammation. The increase in senescent cells with age is believed to contribute to most age-related diseases.¹ Therapies that eliminate senescent cells have been shown to extend healthy lifespan in mice.^{2,3} Senescent cells can be cleared by immune system cells, but with age, immune cells themselves become senescent, creating a vicious cycle of increasing numbers of senescent cells as age progresses.⁴

Dr. de Keizer is concerned that there are many different types of senescent cells, and that therapies to eliminate senescent cells only eliminate a few subtypes, but not others.⁵ In addition, he is concerned that chemotherapy and radiation therapy not only kill cancer cells, but cause many cells to become senescent.⁶⁻⁸ The pro-inflammatory factors secreted by those senescent cells enhance the ability of surviving cancer cells to spread into other tissues (metastasis).⁹ Dr de Keizer believes that therapies targeting senescent cells should be used along with therapies against cancer.¹⁰

Dr. de Keizer has created a cell-penetrating peptide that potently kills senescent cells. Unlike other senescent cell therapies, his peptide is more selective for senescent cells.^{11,12}

Dr. de Keizer has co-founded the company Cleara Biotech (www.clearabiotech.com) dedicated to finding even more effective cell-penetrating peptides to kill senescent cells in the context of cancer therapy. Dr. de Keizer has been raising funds from venture capitalists and has hopes to begin human clinical trials in the near future.

SIRT6 Against Cancer and Aging

Vera Gorbunova, PhD (Co-director Rochester Aging Research Center, University of Rochester, Rochester, New York) is an expert on DNA damage, DNA stability, the effects of SIRT6, and the role these factors play in aging and cancer.

Cancer is a disease of altered DNA, which causes cancer cells to cease their normal functions and instead to simply reproduce and spread. Aging too is a

disease of altered DNA, causing cells to lose their ability to reproduce and perform their normal functions in organs and tissues.

DNA controls all cell functions, but with age DNA not only becomes less stable,¹³ but becomes more likely to become damaged.¹⁴ Both the lack of stability¹⁵ and the increasing DNA damage contribute to the chronic inflammation which causes most age-related diseases, including cardiovascular disease,¹⁶ Alzheimer's Disease,¹⁷ and cancer.¹⁸ DNA damage is a major cause of cellular senescence.¹

Humans have seven **sirtuin enzymes** (SIRT1 to SIRT7), which perform a wide variety of functions important for health and longevity.¹⁹ Dr. Gorbunova is a world expert on SIRT6, which her team has shown maintains DNA stability,¹⁵ and enhances repair of DNA damage.²⁰ Comparing different rodent species of varying lifespans (from 3 to 32 years) her team has shown that the efficiency of the SIRT6 enzyme for DNA repair corresponds to the maximum lifespan of a rodent species.²⁰ Other researchers have shown that SIRT1 has many health benefits and that SIRT6 has been shown to extend lifespan of mice.²¹

For many years **Life Extension®** funded Dr. Gorbunova's SIRT6 research. Noting that resveratrol and similar chemicals enhance the enzyme activity of SIRT1, Dr. Gorbunova sought chemicals which could enhance SIRT6 activity.²² Many SIRT6 activators have been found,²³ including the Asian seaweed polysaccharide **fucoidan**.





The Role of Macrophages in Aging

Eric Verdin, MD (CEO, Buck Institute for Research on Aging, Novato, California) has been investigating the role of macrophages in aging and aging-related diseases.

Macrophages are a type of white blood cell of the immune system that engulfs and digests microbes, cellular debris, and other contaminants. The word macrophage was derived from Greek (macro=big, phage=eater) by the scientist who discovered these cells. Macrophages play an important role in the progression of inflammation-related diseases, including atherosclerosis, diabetes, and cancer.²⁴ Macrophages can be either inflammatory (**M1 macrophages**, which produce inflammatory responses) or anti-inflammatory (**M2 macrophages**, which are attracted to sites of inflammation and produce anti-inflammatory responses).²⁵ With aging, macrophages become increasingly of the M1 type, contributing to **chronic inflammation**.²⁶

Aging is also characterized by an increasing number of **senescent cells**.²⁷ Macrophages are attracted to senescent cells to engulf and remove them.²⁸ But collections of macrophages and senescent cells become increasingly pro-inflammatory, causing nearby cells to become senescent, possibly also including the macrophages themselves.²⁸ The pro-inflammatory macrophages increasingly express the **CD38 enzyme** which degrades the important enzymatic co-factor **NAD⁺**.²⁹

The loss of **NAD⁺** with age results in reduced function of sirtuins and other enzymes required for DNA repair, and reduced capacity of the immune system to function optimally.³⁰

Dr. Verdin presented evidence for the hypothesis that **senescent macrophages** are a substantial source of **NAD⁺** loss and of senescent cells in aging.^{31,32}

Immune System Rejuvenation

Gregory Fahy, PhD (Chief Scientific Officer and Co-founder, Intervene Immune, Torrance, California) described the TRIIM (Thymus Regeneration, Immunorestoring, and Insulin Mitigation) clinical trial that he designed and led, as well as the follow-up extended (TRIIM-X) trial which he is leading, and which is still seeking participants. TRIIM was a pilot study of nine male adults, but TRIIM-X has been seeking 85 adults of diverse gender and ethnicity for a study to be completed in November 2022.

The TRIIM trial was designed to regenerate the thymus gland using **growth hormone**, while attempting to prevent the growth hormone from causing diabetes. **Metformin** and dehydroepiandrosterone (**DHEA**) were the anti-diabetic agents.³³

Dr. Fahy had been inspired to attempt the TRIIM trial by his knowledge that growth hormone has been shown to reconstitute the thymus in rats,³⁴ dogs,³⁵ and HIV-infected patients.³⁶

With age, immune system function declines, leaving elderly persons vulnerable to infection. Persons 65 years or older account for **90%** of influenza-related deaths in the United States.³⁷ Immune system cells produced by the thymus gland (T-cells) decline in function with age,³⁸ due to the fact that the thymus gland shrinks and becomes clogged with fat early in life.³⁹ Fresh (“naive”) T-cells decline by about two orders of magnitude (hundreds of times) between the ages of 20 and 70.⁴⁰

Many animal experiments have shown that reduced growth hormone early in life leads to healthy longevity.⁴¹ By contrast, the TRIIM trial showed that growth hormone given late in life reversed the biological age of nine men an average of 1.5 years,³³ as indicated by DNA methylation “clocks”.⁴²⁻⁴⁵ Not only was T-cell function improved, but there were fewer immune cells expressing the NAD⁺ depleting enzyme CD38. NAD⁺ decline with age underlies many age-related diseases, such that restoration of NAD⁺ could be rejuvenating.⁴⁶

Neural Networks to Predict Biological Age

Alex Zhavoronkov, PhD (CEO, Insilico Medicine, Hong Kong Science Park, Hong Kong) is a scientist and entrepreneur who is employing the deep neural network form of artificial intelligence to understand human aging. **Neural networks** are computer programs that

simulate the way neurons interact to cause learning in the human brain. A neural network is **deep** when it contains many layers of simulated neurons. Unlike conventional computer programs which are given explicit instructions by a computer programmer, neural networks are simply “trained” by data to produce a result without the programmer knowing the details by which the simulated neurons produced that result.

Dr. Zhavoronkov has been inspired in his neural network efforts by the use of DNA methylation clocks to predict human age.⁴⁴ Dr. Zhavoronkov trained deep neural networks on 60,000 human blood samples and thereby identified five blood components that could be used to predict human age.⁴⁷ Predicting biological age can be valuable in human longevity studies because it allows a way of measuring whether a relatively short-term therapeutic intervention successfully slows or reverses aging, rather than having to wait decades for a human lifespan to play out.

Using deep neural networks to analyze the blood samples of people of different nationalities, Dr. Zhavoronkov’s team determined that South Koreans tend to have a predicted age younger than their chronological age, whereas for Eastern Europeans the predicted age is older.⁴⁸

Among his efforts as an entrepreneur, in addition to founding Insilico Medicine (insilico.com, which searches for longevity drugs using artificial intelligence),



Dr. Zhavoronkov has founded Deep Longevity (deep-longevity.com, which specializes in aging clocks), and Longevity Medicine (longevity-medicine.org, which offers a Longevity Medicine Course (longevity.degree) for medical professionals.

Administering \$350 million for Rejuvenation Research

Patrick Burgermeister (Partner, Kizoo Technology Ventures, Germany) spoke about the role of Kizoo Technology Ventures (www.kizoo.com) in providing seed funding, mentoring, and follow-on financing for biotechnology companies focused on rejuvenation.

Kizoo is part of the Forever Healthy Foundation (www.forever-healthy.org) founded by internet entrepreneur **Michael Greve**. Greve has also funded the annual **Undoing Aging** conferences in Berlin, Germany (collaborating with the rejuvenation-focused SENS Foundation). In May 2021 Greve committed an additional 300 million EUROS (about **\$350 million**) for support of rejuvenation biotechnology startups. Greve believes that abolishing cancer, heart attacks, and dementia is just a matter of time, money, and research.

Mr. Burgermeister said that Kizoo funding contrasts with that of typical investors looking for low-risk companies that will soon be profitable. He said that Kizoo prefers companies in the earliest stages of development (sometimes not even yet founded). Kizoo prefers to lead the way, in contrast to “lightweight investors,” who look for companies which already have funding from many other investors.

Kizoo prefers companies in which the founders have a strong financial interest. Some of the companies that Kizoo has funded include Underdog Pharmaceutical (clearing non-degradable cholesterol from arteries), Revel Pharmaceutical (therapeutic enzymes to degrade age-associated molecular damage), Cellvie (mitochondrial augmentation and replacement), and



Turn Biotechnologies (epigenetically reprogramming cells to be younger), among other companies. Mr. Burgermeister serves as a director for some of the Kizoo-funded companies.

Concluding Remarks

It is encouraging to see not only the development of therapies to slow aging, but to potentially reverse aging. The advent of this potential has gratifyingly brought increasing amounts of money into aging research, along with entrepreneurial activity associated with therapies. ●

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



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FAHY



BURGERMEISTER



GORBUNOVA



VERDIN

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What Is Milk Thistle?

BY LAURIE MATHENA



Deaths from **liver cirrhosis** jumped **65%** in the U.S. between **1999** and **2016**.^{3,4}

Key factors contributing to **liver disease** are obesity, diet, and alcohol consumption.^{1,2}

Milk thistle extract has demonstrated protective effects against an array of liver disorders.⁵⁻⁸

Nonalcoholic Fatty Liver Disease

In the past, **viral hepatitis** and excess **alcohol** ingestion were considered the greatest threats to the liver.²

Today, the surge in diabetes and obesity has resulted in an epidemic of **nonalcoholic fatty liver disease (NAFLD)**,⁹ which is characterized by the accumulation of **fatty compounds** in the liver in the absence of chronic alcohol use.

It can progress over time to cause liver **fibrosis** (tissue scarring) that can lead to liver cancer, cirrhosis, and/or liver failure.¹⁰⁻¹³

Extracts of the herb **milk thistle**, containing the compound **silymarin**, have long been used to protect liver function in patients with liver disease.

Several clinical trials found that milk thistle, alone or in combination with vitamin E, and phosphatidylcholine reduces liver fat, fibrosis, and enzyme levels in patients with NAFLD.¹⁴⁻¹⁷

A meta-analysis of eight randomized, controlled trials found that **milk thistle** may help improve **NAFLD**.¹⁷

Milk thistle has been shown to improve **blood markers of liver damage** and may also help reduce fasting **glucose** and **LDL cholesterol** elevations that often accompany NAFLD.^{17,18}

Measuring liver *enzyme* blood levels is an important tool for identifying liver injury and helping track response to treatment.

Liver function tests are included in many **Life Extension®** blood panels.

Liver Toxins

The liver is susceptible to toxins known as **hepatotoxins**, which include the commonly used pain medication acetaminophen, alcohol, and others.

In rats, milk thistle extract helped prevent liver damage when given before or during the exposure to a liver toxin.¹⁹

In one study, a group of patients with alcohol-induced liver disease who were treated with milk thistle extract showed improvements in liver enzymes *and* liver pathology.⁸

Cirrhosis

Cirrhosis is the end stage of chronic liver injury in both alcoholic and nonalcoholic liver disease. It is generally considered *irreversible*, but scientists have observed promising improvements with milk thistle extract in clinical trials.

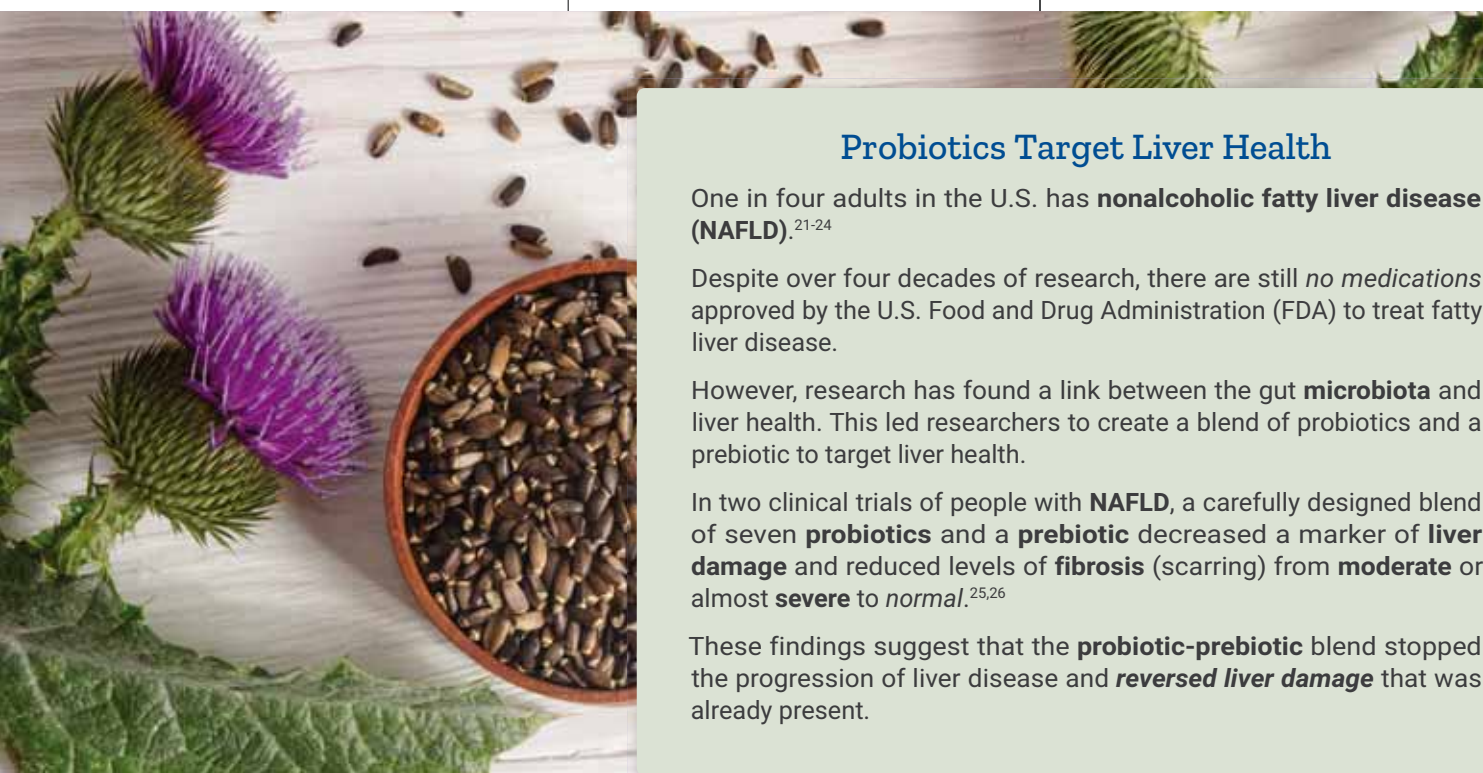
In one study, giving **420 mg** of milk thistle extract to patients with cirrhosis was associated with an overall higher **four-year survival rate**.⁵

For optimal absorption, a **standardized extract of milk thistle** is used by readers of this publication that has been made more bioavailable via a **phospholipid delivery system**.²⁰ •

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

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Probiotics Target Liver Health

One in four adults in the U.S. has **nonalcoholic fatty liver disease (NAFLD)**.²¹⁻²⁴

Despite over four decades of research, there are still *no medications* approved by the U.S. Food and Drug Administration (FDA) to treat fatty liver disease.

However, research has found a link between the gut **microbiota** and liver health. This led researchers to create a blend of probiotics and a prebiotic to target liver health.

In two clinical trials of people with **NAFLD**, a carefully designed blend of seven **probiotics** and a **prebiotic** decreased a marker of **liver damage** and reduced levels of **fibrosis** (scarring) from **moderate** or almost **severe** to *normal*.^{25,26}

These findings suggest that the **probiotic-prebiotic** blend stopped the progression of liver disease and **reversed liver damage** that was already present.

Other Nutrients That Promote Liver Health

Some nutrients have also shown promise as a way to help control liver disease.

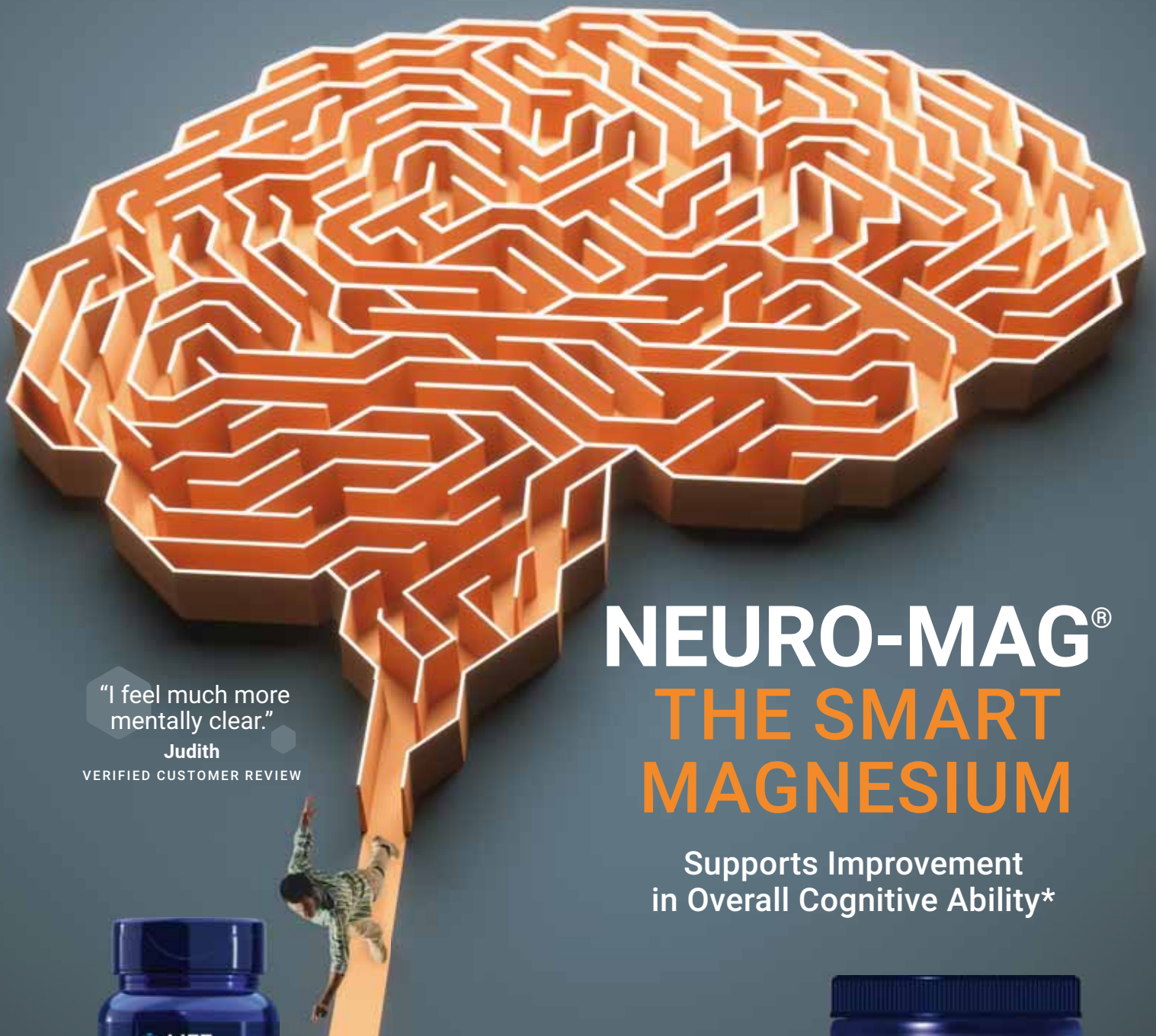
In human trials, **vitamin E tocotrienols** improved markers of liver health seen on an ultrasound, while reducing liver enzymes, C-reactive protein, and signs of oxidative stress.²⁷⁻²⁹

Phosphatidylcholine is an essential phospholipid which is a vital part of cellular membranes. Phospholipids have been used safely for years to protect liver function in patients with various liver diseases.³⁰ In a number of human trials, phosphatidylcholine intake alone or with other nutrients improved NAFLD, reducing liver enzyme levels and improving ultrasound findings.³⁰⁻³² A more **bioavailable** form of phosphatidylcholine known as **polyenylphosphatidylcholine** or **PCC** is the preferred choice for liver support as it specifically targets hepatocytes.

N-acetyl-L-cysteine (NAC), a versatile sulfur-rich compound prevents liver damage following acetaminophen poisoning.³³ NAC rapidly restores depleted **glutathione** levels, sparing liver cells from the effects of oxidative damage.³⁴⁻³⁶



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Robin Downes: “Yoga Saved My Father’s Life”

BY LAURIE MATHENA



Robin Downes is an Emmy award-winning journalist who worked on high-profile television shows such as the ABC News show *20/20* and *The Cosby Show*, and as the production coordinator for Spike Lee films.

But after experiencing a personal tragedy, Downes left behind her prestigious career in the entertainment industry to pursue something she believed had much more meaning: yoga.

Over the next 25 years, Downes sold millions of yoga instructional videos and became the “yoga instructor to the stars,” teaching private yoga sessions to celebrities and sports stars like Brandy, Vanessa Williams, and NBA star John Sally.

Now, her most important client yet is someone she affectionately calls “Sergeant Major”—her father.

How Yoga “Resurrected” Her Father

Downes admittedly had a fairytale career in the entertainment industry. So, at age 41, when she was faced with marriage problems and her mother’s breast cancer diagnosis, she needed tools to help her cope with stress.

That's when she turned to yoga.

"In 1995, I walked into my first yoga class, and I knew that this was what I needed," said Downes. "When stress and reality hit, it was yoga that saved me."

Now, at age 61, she is using those same tools to help save her elderly father.

Downes' father was malnourished, depressed, and drinking too much—plus dealing with health problems like congestive heart failure, high blood pressure, and dementia.

He needed an intervention.

"I was able to draw on the wonderful experience I had gathered from treating my VIP yoga clients," said Downes. "I thought maybe I could use yoga to help him out in his final days of life, but that was four years ago. Instead, yoga was able to resurrect my dad."

Downes started with simple, seated poses designed to help her father breathe better.

"As we get older, we start to walk hunched over. My father had begun to walk with a cane. All of this diminishes your capacity to breathe," said Downes.

It also impacts balance and flexibility.

To help combat this, Downes likes to do a pose called Tadasana Mountain Pose with her father. It encourages participants to ground their feet, lift their chest, push their shoulders back, and sit tall—and then take deep, cleansing breaths.

Poses like these—all of which can be done seated in a chair—can help older individuals gain flexibility, strength, and balance, while also providing what Downes calls a "sense of ease."

Studies have shown the beneficial impact this can have on dementia patients.

In one study, regular yoga sessions were found to improve respiratory function, improve balance control in Alzheimer's patients, and help calm agitated patients.

And in an exciting study of people with mild cognitive impairment, 12 weeks of yoga led to short- and long-term improvements in executive functioning and produced beneficial effects on depressed mood and resilience.

Yoga can also reduce stress for both the patient and the caregiver, which is why Downes participates in a program called Caregivers Embracing Elder Care.

Through this program, Downes guides caregivers through meditation and yoga moves, and a geriatric care manager provides practical tips for caregivers of elderly patients.

"Yoga provides a greater sense of ease, greater mobility, and ultimately greater longevity," said Downes.

Yoga Flava®

Downes knew her father might not be receptive to traditional yoga. Fortunately, her yoga style is anything but traditional.

Her yoga company, called Yoga Flava®, is unique because it combines ancient yoga practice with urban culture and modern music.

"It uses ancient moves to contemporary grooves," said Downes.

In fact, when Downes pioneered Yoga Flava® in 1995, she produced an instructional video and became the first African American female to have an internationally distributed yoga video.

Working with her father showed her that this unique take on yoga transcended generations as well as cultures.

"Yoga Flava® has achieved such remarkable success because it uses music that's familiar," said Downes. "For me, that means Erykah Badu or Mary J. Blige. For my father, that means doing yoga to salsa music or Nat King Cole."

Choosing Your Best Life

Downes knows that in order to care for her father, she needs to care for herself as well. That's why, in addition to her yoga practice, she has started boxing.

"It's another way of relieving stress, and it's a great cross-training program for me at this point," said Downes. "I know I need to be doing everything I can to help with caregiving. In addition to managing my stress level, I need to maintain my strength."

She also eats lots of fresh fruit and vegetables and takes numerous supplements, including vitamins A, C, and D, biotin, iodine, zinc, selenium, collagen, turmeric, and fish oil.

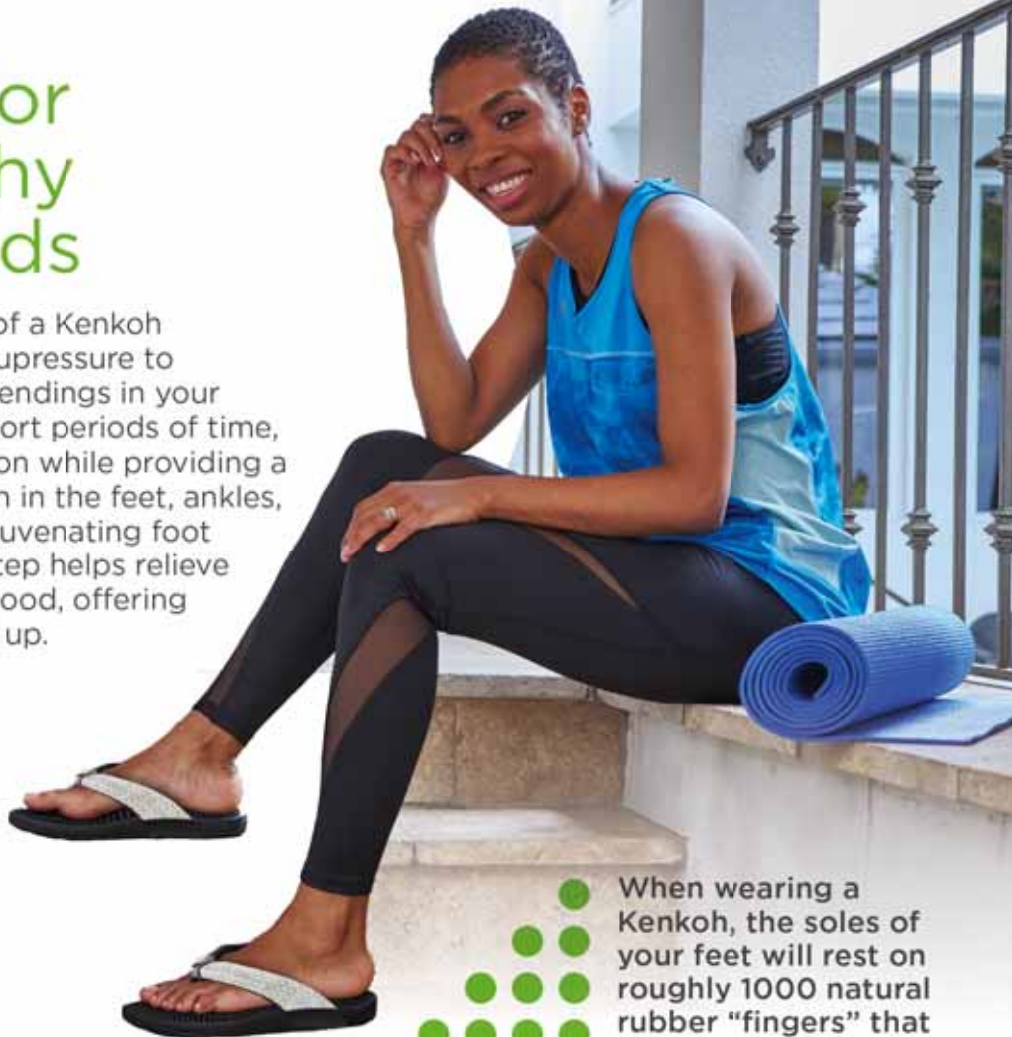
She believes it's all part of a holistic lifestyle that contributes to longevity, both for her and for her father.

"Every day we can pick and choose how we want to live our best life," said Downes. "For me, it's about perspective. I get to enjoy my father, and I get to create a lifestyle that can bring both of us joy." •

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

Your source for *all* your healthy footwear needs

The precisely designed footbeds of a Kenkoh Massage Sandal work by using acupressure to revitalize and stimulate the nerve endings in your feet. When worn daily, even for short periods of time, Kenkoh helps to increase circulation while providing a non-intrusive way of reducing pain in the feet, ankles, knees, legs, hips and back. The rejuvenating foot massage you receive with every step helps relieve stress and enhance your overall mood, offering optimal wellness from the ground up.



Spirit Black and White



Spirit Royal Blue



Spirit Brown



Serenity Black



Chai Champagne



Grace Pewter

When wearing a Kenkoh, the soles of your feet will rest on roughly 1000 natural rubber "fingers" that will massage and stimulate key reflex points. This targeted therapy, known as reflexology, has long been practiced in Eastern cultures as a way of reducing pain, stress and anxiety.

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- 02020 Super Carnosine
- 02023 Tart Cherry with CherryPURE®
- 02146 Wellness Bar—Chocolate Brownie
- 02147 Wellness Bar—Cookie Dough
- 02246 Wellness Code® Advanced Whey Protein Isolate Vanilla
- 02221 Wellness Code® Muscle Strength & Restore Formula
- 02127 Wellness Code® Plant Protein Complete & Amino Acid Complex
- 02261 Wellness Code® Whey Protein Concentrate Chocolate
- 02260 Wellness Code® Whey Protein Concentrate Vanilla
- 02243 Wellness Code® Whey Protein Isolate Chocolate
- 02242 Wellness Code® Whey Protein Isolate Vanilla

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- 01253 Branched Chain Amino Acids
- 01829 Carnosine
- 01671 D,L-Phenylalanine Capsules
- 01624 L-Arginine Caps
- 01532 L-Carnitine
- 00345 L-Glutamine
- 00141 L-Glutamine Powder
- 01678 L-Lysine
- 01827 Taurine
- 00133 Taurine Powder
- 00326 Tyrosine Tablets

BLOOD PRESSURE & VASCULAR SUPPORT

- 01824 Advanced Olive Leaf Vascular Support
- 02004 Arterial Protect
- 02497 Endothelial Defense™ Pomegranate Plus
- 02320 NitroVasc™ Boost
- 00984 Optimal BP Management
- 01953 Pomegranate Complete
- 00956 Pomegranate Fruit Extract
- 02024 Triple Action Blood Pressure AM/PM
- 02102 VenoFlow™

BONE HEALTH

- 01726 Bone Restore
- 02123 Bone Restore Chewable Tablet
- 02416 Bone Restore Elite with Super Potent K2
- 01727 Bone Restore with Vitamin K2
- 01725 Bone Strength Collagen Formula
- 00313 Bone-Up™
- 01963 Calcium Citrate with Vitamin D
- 01506 Dr. Strum's Intensive Bone Formula
- 02417 Mega Vitamin K2
- 01476 Strontium Caps

BRAIN HEALTH

- 01524 Acetyl-L-Carnitine
- 01974 Acetyl-L-Carnitine Arginate
- 02419 B12 Elite
- 02510 Brain Fog Relief
- 01659 CDP Choline
- 02321 Cognitex® Basics
- 02396 Cognitex® Elite
- 02397 Cognitex® Elite Pregnenolone
- 01540 DMAE Bitartrate
- 02006 Dopa-Mind™
- 02413 Dopamine Advantage
- 02212 Focus Tea™
- 01658 Ginkgo Biloba Certified Extract™
- 01527 Huperzine A
- 00020 Lecithin
- 02101 Memory Protect

- 00709 Migra-Eeze™
- 01603 Neuro-Mag® Magnesium L-Threonate Caps
- 02032 Neuro-Mag® Magnesium L-Threonate Powder
- 00888 Optimized Ashwagandha
- 01676 PS (Phosphatidylserine) Caps
- 02406 Quick Brain Nootropic
- 01327 Vinpocetine

CHOLESTEROL MANAGEMENT

- 01828 Advanced Lipid Control
- 01359 Cho-Less™
- 01910 CHOL-Support™
- 01030 Red Yeast Rice
- 01304 Theaflavins Standardized Extract
- 00372 Vitamin B3 Niacin Capsules

DIGESTION SUPPORT

- 53348 Betaine HCl
- 02412 Bloat Relief
- 30747 Digest RC®
- 07136 Effervescent Vitamin C - Magnesium Crystals
- 02021 Enhanced Super Digestive Enzymes
- 02022 Enhanced Super Digestive Enzymes and Probiotics
- 02033 EsophaCool™
- 01737 Esophageal Guardian
- 01706 Extraordinary Enzymes
- 02100 Gastro-Ease™
- 01122 Ginger Force™
- 00605 Regimint
- 01386 TruFiber®

ENERGY MANAGEMENT

- 01628 Adrenal Energy Formula • 60 veg capsules
- 01630 Adrenal Energy Formula • 120 veg capsules
- 00972 D-Ribose Powder
- 01473 D-Ribose Tablets
- 01900 Energy Renew
- 01544 Forskolin
- 01805 Ginseng Energy Boost
- 00668 Metabolic Advantage Thyroid Formula™
- 01869 Mitochondrial Basics with PQQ
- 01868 Mitochondrial Energy Optimizer with PQQ
- 01904 NAD+ Cell Regenerator™ • 100 mg, 30 veg capsules
- 02344 NAD+ Cell Regenerator™ 300 mg, 30 veg capsules
- 02348 NAD+ Cell Regenerator™ and Resveratrol
- 01500 PQQ Caps • 10 mg, 30 vegetarian capsules
- 01647 PQQ Caps • 20 mg, 30 vegetarian capsules
- 00889 Rhodiola Extract
- 02003 Triple Action Thyroid

EYE HEALTH

- 01923 Astaxanthin with Phospholipids
- 00893 Brite Eyes III
- 02323 Digital Eye Support
- 01514 Eye Pressure Support with Mirtogenol®
- 01992 MacuGuard® Ocular Support with Saffron
- 01993 MacuGuard® Ocular Support with Saffron & Astaxanthin
- 01873 Standardized European Bilberry Extract
- 01918 Tear Support with MaquiBright®

FISH OIL & OMEGAS

- 01937 Mega EPA/DHA
- 02218 Mega GLA Sesame Lignans
- 01983 Super Omega-3 EPA/DHA Fish Oil, Sesame Lignans & Olive Extract • 60 softgels
- 01988 Super Omega-3 Plus EPA/DHA Fish Oil, Sesame Lignans, Olive Extract, Krill & Astaxanthin
- 01982 Super Omega-3 EPA/DHA Fish Oil, Sesame Lignans & Olive Extract • 120 softgels

- 01985 Super Omega-3 EPA/DHA Fish Oil, Sesame Lignans & Olive Extract • 60 enteric coated softgels
- 01984 Super Omega-3 EPA/DHA Fish Oil, Sesame Lignans & Olive Extract • 120 enteric coated softgels
- 01986 Super Omega-3 EPA/DHA Fish Oil, Sesame Lignans & Olive Extract • 240 softgels
- 01812 Provinal® Purified Omega-7
- 01640 Vegetarian DHA

FOOD

- 02008 California Estate Extra Virgin Olive Oil
- 02170 Rainforest Blend Decaf Ground Coffee
- 02169 Rainforest Blend Ground Coffee
- 02171 Rainforest Blend Whole Bean Coffee
- 00438 Stevia™ Organic Liquid Sweetner
- 00432 Stevia™ Sweetener

GLUCOSE MANAGEMENT

- 01503 CinSulin® with InSea²® and Crominex® 3+
- 01620 CoffeeGenic® Green Coffee Extract
- 02122 Glycemic Guard™
- 00925 Mega Benfotiamine
- 01803 Tri Sugar Shield®

HEART HEALTH

- 01066 Aspirin (Enteric Coated)
- 01842 BioActive Folate & Vitamin B12 Caps
- 01700 Cardio Peak™
- 02121 Homocysteine Resist
- 02018 Optimized Carnitine
- 01949 Super-Absorbable CoQ10 Ubiquinone with *d*-Limonene • 50 mg, 60 softgels
- 01951 Super-Absorbable CoQ10 Ubiquinone with *d*-Limonene • 100 mg, 60 softgels
- 01929 Super Ubiquinol CoQ10
- 01427 Super Ubiquinol CoQ10 with Enh Mitochondrial Support™ • 50 mg, 30 softgels
- 01425 Super Ubiquinol CoQ10 with Enh Mitochondrial Support™ • 50 mg, 100 softgels
- 01437 Super Ubiquinol CoQ10 with Enh Mitochondrial Support™ • 100 mg, 30 softgels
- 01426 Super Ubiquinol CoQ10 with Enh Mitochondrial Support™ • 100 mg, 60 softgels
- 01431 Super Ubiquinol CoQ10 with Enh Mitochondrial Support™ • 200 mg, 30 softgels
- 01733 Super Ubiquinol CoQ10 with PQQ
- 01859 TMG Liquid Capsules
- 00349 TMG Powder

HORMONE BALANCE

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- 00335 DHEA • 25 mg, 100 capsules
- 00882 DHEA • 50 mg, 60 capsules
- 00607 DHEA • 25 mg, 100 vegetarian dissolve in mouth tablets
- 01689 DHEA • 100 mg, 60 veg capsules
- 02368 Optimized Broccoli and Cruciferous Blend
- 00302 Pregnenolone • 50 mg, 100 capsules
- 00700 Pregnenolone • 100 mg, 100 capsules
- 01468 Triple Action Cruciferous Vegetable Extract
- 01469 Triple Action Cruciferous Vegetable Extract and Resveratrol

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- 02411 5 Day Elderberry Immune
- 00681 AHCC®
- 02302 Bio-Quercetin®
- 02410 Black Elderberry + Vitamin C
- 01961 Enhanced Zinc Lozenges
- 01704 Immune Modulator with Tinofend®
- 02425 Immune Packs with Vitamin C & D, Zinc and Probiotic

- 02005 Immune Senescence Protection Formula™
- 00316 Kyolic® Garlic Formula 102
- 00789 Kyolic® Reserve
- 01681 Lactoferrin (Apolactoferrin) Caps
- 02426 Mushroom Immune with Beta Glucans
- 01903 NK Cell Activator™
- 01394 Optimized Garlic
- 01309 Optimized Quercetin
- 01811 Peony Immune
- 00525 ProBoost Thymic Protein A
- 01708 Reishi Extract Mushroom Complex
- 01906 Standardized Cistanche
- 13685 Ten Mushroom Formula®
- 01097 Ultra Soy Extract
- 01561 Zinc Lozenges

INFLAMMATION MANAGEMENT

- 01639 5-LOX Inhibitor with AprèsFlex®
- 02324 Advanced Curcumin Elite™
Turmeric Extract, Ginger & Turmerones
- 01709 Black Cumin Seed Oil
- 02310 Black Cumin Seed Oil and Curcumin Elite™
- 00202 Boswella
- 02467 Curcumin Elite™ Turmeric Extract • 30 veg capsules
- 02407 Curcumin Elite™ Turmeric Extract • 60 veg capsules
- 01804 Cytokine Suppress® with EGCG
- 02223 Pro-Resolving Mediators
- 00318 Serrafazyme
- 01203 Specially-Coated Bromelain
- 00407 Super Bio-Curcumin® Turmeric Extract
- 01254 Zyflamend™ Whole Body

JOINT SUPPORT

- 02404 Arthro-Immune Joint Support
- 02238 ArthroMax® Advanced NT2 Collagen™ & AprèsFlex®
- 01617 ArthroMax® with Theaflavins & AprèsFlex®
- 02138 ArthroMax® Elite
- 00965 Fast-Acting Joint Formula
- 02430 Fast Acting Relief
- 00522 Glucosamine/Chondroitin Capsules
- 02420 Glucosamine Sulfate
- 02424 Joint Mobility
- 01600 Krill Healthy Joint Formula
- 01050 Krill Oil
- 00451 MSM (Methylsulfonylmethane)
- 02231 NT2 Collagen™

KIDNEY & BLADDER SUPPORT

- 00862 Cran-Max® Cranberry Whole Fruit Concentrate
- 01424 Optimized Cran-Max® with Ellirose™
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- 01209 Water-Soluble Pumpkin Seed Extract

LIVER HEALTH & DETOXIFICATION

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

LONGEVITY & WELLNESS

- 00457 Alpha-Lipoic Acid
- 01625 AppleWise
- 02414 Bio-Fisetin
- 01214 Blueberry Extract
- 01438 Blueberry Extract and Pomegranate
- 02270 DNA Protection Formula
- 02431 Essential Youth - L-Ergothioneine
- 02119 GEROPROTECT® Ageless Cell™
- 02415 GEROPROTECT® Autophagy Renew
- 02133 GEROPROTECT® Longevity A.I.™
- 02401 GEROPROTECT® Stem Cell
- 02211 Grapeseed Extract
- 00954 Mega Green Tea Extract (decaffeinated)
- 00953 Mega Green Tea Extract (lightly caffeinated)
- 01513 Optimized Fucoidan with Maritech® 926
- 02230 Optimized Resveratrol
- 01637 Pycnogenol® French Maritime Pine Bark Extract
- 02210 Resveratrol
- 00070 RNA (Ribonucleic Acid)
- 02301 Senolytic Activator®
- 01208 Super R-Lipoic Acid
- 01919 X-R Shield

MEN'S HEALTH

- 02209 Male Vascular Sexual Support
- 00455 Mega Lycopene Extract
- 02306 Men's Bladder Control
- 01789 PalmettoGuard® Saw Palmetto and Beta-Sitosterol
- 01790 PalmettoGuard® Saw Palmetto/Nettle Root Formula and Beta-Sitosterol
- 01837 Pomi-T®
- 01373 Prelox® Enhanced Sex for Men
- 01940 Super MiraForte with Standardized Lignans
- 02500 Testosterone Elite
- 01909 Triple Strength ProstaPollen™
- 02029 Ultra Prostate Formula

MINERALS

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

MISCELLANEOUS

- 00577 Potassium Iodide
- 00657 Solarshield® Sunglasses

MOOD & STRESS MANAGEMENT

- 02434 Calm-Mag
- 02312 Cortisol-Stress Balance
- 00987 Enhanced Stress Relief
- 01074 5 HTP
- 01683 L-Theanine
- 02175 SAMe (S-Adenosyl-Methionine)
200 mg, 30 enteric coated vegetarian tablets
- 02176 SAMe (S-Adenosyl-Methionine)
400 mg, 30 enteric coated vegetarian tablets
- 02174 SAMe (S-Adenosyl-Methionine)
400 mg, 60 enteric coated vegetarian tablets
- 02429 Theanine XR™ Stress Relief

MULTIVITAMINS

- 02199 Children's Formula Life Extension Mix™
- 02354 Life Extension Mix™ Capsules
- 02364 Life Extension Mix™ Capsules without Copper
- 02356 Life Extension Mix™ Powder
- 02355 Life Extension Mix™ Tablets
- 02357 Life Extension Mix™ Tablets with Extra Niacin
- 02365 Life Extension Mix™ Tablets without Copper
- 02292 Once-Daily Health Booster • 30 softgels
- 02291 Once-Daily Health Booster • 60 softgels
- 02313 One-Per-Day Tablets
- 02428 Plant-Based Multivitamin
- 02317 Two-Per-Day Capsules • 60 capsules
- 02314 Two-Per-Day Capsules • 120 capsules
- 02316 Two-Per-Day Tablets • 60 tablets
- 02315 Two-Per-Day Tablets • 120 tablets

NERVE & COMFORT SUPPORT

- 02202 ComfortMAX™
- 02303 Discomfort Relief

PERSONAL CARE

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

PET CARE

- 01932 Cat Mix
- 01931 Dog Mix

PROBIOTICS

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

SKIN CARE

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

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

SLEEP

- 01512 Bioactive Milk Peptides
- 02300 Circadian Sleep
- 01551 Enhanced Sleep with Melatonin
- 01511 Enhanced Sleep without Melatonin
- 02234 Fast-Acting Liquid Melatonin
- 01669 Glycine
- 02308 Herbal Sleep PM
- 01722 L-Tryptophan
- 01668 Melatonin • 300 mcg, 100 veg capsules
- 01083 Melatonin • 500 mcg, 200 veg capsules
- 00329 Melatonin • 1 mg, 60 capsules
- 02503 Melatonin • 3 mg, 60 gummies
- 00330 Melatonin • 3 mg, 60 veg capsules
- 00331 Melatonin • 10 mg, 60 veg capsules
- 00332 Melatonin • 3 mg, 60 veg lozenges
- 02201 Melatonin IR/XR
- 01787 Melatonin 6 Hour Timed Release
300 mcg, 100 veg tablets
- 01788 Melatonin 6 Hour Timed Release
750 mcg, 60 veg tablets

- 01786 Melatonin 6 Hour Timed Release 3 mg, 60 veg tablets
- 01721 Optimized Tryptophan Plus
- 01444 Quiet Sleep
- 01445 Quiet Sleep Melatonin
- 02502 Rest & Renew

VITAMINS

- 01533 Ascorbyl Palmitate
- 00920 Benfotiamine with Thiamine
- 00664 Beta-Carotene
- 01945 BioActive Complete B-Complex
- 00102 Biotin
- 00084 Buffered Vitamin C Powder
- 02229 Fast-C® and Bio-Quercetin Phytosome
- 02075 Gamma E Mixed Tocopherol Enhanced with
Sesame Lignans
- 02070 Gamma E Mixed Tocopherol & Tocotrienols
- 01913 High Potency Optimized Folate
- 01674 Inositol Caps
- 02244 Liquid Vitamin D3 • 50 mcg (2000 IU)
- 02232 Liquid Vitamin D3 (Mint) • 50 mcg (2000 IU)
- 01936 Low-Dose Vitamin K2
- 00065 MK-7
- 00373 No Flush Niacin
- 01939 Optimized Folate (L-Methylfolate)
- 01217 Pyridoxal 5'-Phosphate Caps
- 01400 Super Absorbable Tocotrienols
- 02334 Super K
- 01863 Super Vitamin E
- 02422 Vegan Vitamin D3
- 02028 Vitamin B5 (Pantothenic Acid)
- 01535 Vitamin B6
- 00361 Vitamin B12 Methylcobalamin
- 01536 Vitamin B12 Methylcobalamin • 1 mg, 60 veg lozenges
- 01537 Vitamin B12 Methylcobalamin • 5 mg, 60 veg lozenges
- 02228 Vitamin C and Bio-Quercetin Phytosome • 60 veg tablets
- 02227 Vitamin C and Bio-Quercetin Phytosome • 250 veg tablets
- 01753 Vitamin D3 • 25 mcg (1000 IU), 90 softgels
- 01751 Vitamin D3 • 25 mcg (1000 IU), 250 softgels
- 01713 Vitamin D3 • 125 mcg (5000 IU), 60 softgels
- 01718 Vitamin D3 • 175 mcg (7000 IU), 60 softgels
- 01758 Vitamin D3 with Sea-Iodine™
- 02040 Vitamins D and K with Sea-Iodine™

WEIGHT MANAGEMENT & BODY COMPOSITION

- 02479 7-Keto® DHEA Metabolite • 100 mg, 60 veg capsules
- 01807 Advanced Appetite Suppress
- 02207 AMPK Metabolic Activator
- 02504 Body Trim and Appetite Control
- 02478 DHEA Complete
- 01738 Garcinia HCA
- 01908 Mediterranean Trim with Sinetrol™ -XPur
- 01432 Optimized Saffron
- 00818 Super CLA Blend with Sesame Lignans
- 02509 Waistline Control™

WOMEN'S HEALTH

- 01942 Breast Health Formula
- 01626 Enhanced Sex for Women 50+
- 01894 Estrogen for Women
- 01064 Femmenessence MacaPause®
- 02204 Menopause 731™
- 02319 Prenatal Advantage
- 01441 Progesta-Care®
- 01649 Super-Absorbable Soy Isoflavones
- 02507 Youthful Woman 40+ with B-Complex



share a Longer Life



Selenium promotes the body's production of **glutathione**, a potent cellular antioxidant. It also encourages healthy cell division, thyroid health, and immune function.

Super Selenium Complex combines three complementary forms of selenium with vitamin E for additional antioxidant protection.

Item #01778 • 100 vegetarian capsules

1 bottle \$10.50 • 4 bottles \$9 each

Each bottle provides a supply that lasts more than three months.

For full product description and to order **Super Selenium Complex**, 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.

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CUSTOMIZE YOUR BONE-HEALTH PROGRAM

1. **Bone Restore** helps maintain healthy bone density with three different forms of **calcium** plus vitamin D3 and magnesium, boron, zinc, manganese, and silicon.

OR

2. **Bone Restore with Vitamin K2**, same formula as Bone Restore plus **200 mcg** of vitamin K2.

OR

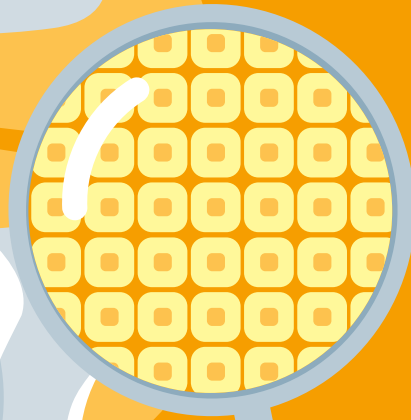
3. **Bone Restore Elite**, same formula as Bone Restore plus **45,000 mcg** of vitamin K2.



Bone Restore

Item #01726 • 120 capsules

1 bottle \$16.50 • 4 bottles \$14.25 each



Bone Restore with Vitamin K2*

Item #01727 • 120 capsules

1 bottle \$18 • 4 bottles \$16.50 each



Bone Restore Elite with Super Potent K2*

Item #02416 • 120 capsules

1 bottle \$34.50 • 4 bottles \$31.50 each

For full product description and to order all **BONE RESTORE** products, call **1-800-544-4440** or visit www.LifeExtension.com

* **CAUTION:** If you are taking a vitamin K antagonist (e.g. warfarin), consult your healthcare practitioner before taking this product.

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IN THIS EDITION OF *LIFE EXTENSION* MAGAZINE[®]



7 SILENT DISORDER GOES EPIDEMIC

Nonalcoholic **fatty liver disease** (NAFLD) afflicts up to **75%** of **overweight** adults and **type II diabetics**. Learn how to control or reverse this life-threatening disorder.

20 CALMING EFFECTS OF MAGNESIUM

Low magnesium levels can worsen chronic stress. A new magnesium enables a calming effect.



28 CANCER-FIGHTING PATHWAYS

Compounds found in **cruciferous vegetables** target **six pathways** to reduce **cancer** risk.

38 CONSTIPATION AND ASSOCIATED HEALTH RISKS

A targeted **probiotic** *decreases* chronic constipation by **42%** and *increases* colon transit time up to **57%**.

48 Fisetin AND BRAIN AGING

Oral **fisetin** supports neurological health via dozens of biological mechanisms. Combining it with **fenugreek** fiber *increases* its bioavailability.



65 WHAT IS MILK THISTLE?

Milk thistle extract has protective effects against various liver disorders.

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