



Dr. David Brownstein Presents

A MEDIX SELECT SPECIAL HEALTH REPORT

A Doctor's Guide to a Healthy Immune System

Every day, you are exposed to millions of microscopic invaders — bacteria, viruses, parasites, and other pathogens — that have the potential to invade your body and affect your health. This is not something you can avoid. You touch various surfaces and eat foods that have been touched by others. You inhabit spaces with other human beings who are sick.

Because of this relentless assault, your body has developed a complex plan to keep you safe — your immune system.

This report will give you some basic knowledge about your immune system. You'll see what can go wrong when the system breaks down, and how to boost its function for a healthy life. You'll also come to understand why taking good care of your immune system is particularly important as you grow older.

What Is the Immune System?

The immune system is not just one “thing.” It is an entire network of cells, tissues, and organs that work together to protect your body from pathogens, which are biologic or infectious agents that can cause disease or illness. Your immune system helps your body recognize these “foreign” organisms and keep them from entering your

body. When that doesn't work, it uses specialized methods to find and destroy them.



You start out in life with what is called passive immunity. As a newborn baby, you acquired immunity from your mother through the placenta. This works only temporarily, as your own immune system develops.

In general, there are two main subsystems of your immune system: the innate immune system and the adaptive immune system.

THE INNATE IMMUNE SYSTEM

Your innate immune system is your dominant system for defense, responding immediately to

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potential invaders. Unlike the adaptive immune system you will hear about next, the innate system operates in a general manner rather than responding to specific pathogens. In addition, it does not provide the same long-lasting immunity you get from the adaptive system.

It provides anatomical or surface barriers — mechanical, chemical, and biological — that act as your first line of defense against invading organisms.

For example, your skin provides a mechanical barrier to defend against pathogens. Additionally, tears and urine work mechanically to expel pathogens. The mechanisms of coughing and sneezing eject potentially harmful organisms, and mucus in the GI and respiratory tract serves to trap and isolate organisms or substances that could be hazardous.

You also have chemical barriers to protect against infection. Enzymes in your saliva and tears have antibacterial properties. Your skin and respiratory tract secrete certain antimicrobial peptides. Your stomach produces gastric acid and enzymes that defend against pathogens you have ingested. Even semen and vaginal secretions contain protective and defensive chemicals.

Biological barriers such as the pH or acid-alkaline balance of your body may change the conditions in your blood, for example, to make it less hospitable to pathogens. Another example would be the “friendly” or probiotic bacteria in your GI tract that, ideally, outnumber and thus successfully compete with harmful organisms.

The innate immune system also contains cells with receptors that recognize potential dangers. These receptors can broadly recognize viruses, bacteria, fungi, parasites, and even non-infectious

problems, but they cannot distinguish between specific types of organisms.

There are several different types of specialized innate immune cells, including neutrophils, basophils, eosinophils, monocytes, macrophages, mast cells, and dendritic cells.

Neutrophils are the most numerous innate immune cells in your bloodstream. They are able to engulf and ingest invading organisms. Basophils and eosinophils are important white blood cells that defend against parasites and function during allergic reactions. Mast cells, found on tissue boundaries, also defend against parasites, and are important during allergic reactions. Monocytes are white blood cells that respond to immune problems, and develop into macrophages, which ingest and destroy pathogens. Dendritic cells act as messengers between the innate and adaptive immune systems, and process antigens, which are foreign substances that cause your body to produce antibodies against them.

All these innate cells can respond quickly and broadly whenever a potential problem arises, and serve to initiate the second form of immune response — adaptive immunity. Innate cells are vital to defend you against invading organisms. Disorders in the innate system can make you overly susceptible to infection.

THE ADAPTIVE IMMUNE SYSTEM

While innate immunity occurs immediately, when circulating innate cells recognize a potential problem, adaptive immunity occurs later. This form of immunity relies on the coordination of more sophisticated immune cells.

Unlike innate immune responses, adaptive responses are highly specific to the particular

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pathogen that caused them. They also provide long-lasting protection. Someone who recovers from mumps, for example, is protected for life against mumps by the adaptive immune system, but not against other viruses, such as those that cause chickenpox or measles.

While adaptive immune responses serve to destroy invading pathogens, it is crucial that they respond only to molecules that are foreign to the body and not to those of the body itself. The ability to distinguish between what is “foreign” and what is “self” is a central aspect of the adaptive immune system. At times, the adaptive system fails to make this distinction and reacts destructively against the body’s own cells. The result may be an autoimmune disease, which can be fatal.

Adaptive immune responses involve specialized white blood cells called lymphocytes. There are two different types of such responses — antibody responses and cell-mediated immune responses. They are carried out by different groups of lymphocytes, called B cells and T cells, respectively.

During antibody responses, B cells become activated and secrete antibodies, which are proteins known as immunoglobulins. These antibodies circulate in the bloodstream and other body fluids, where they bind specifically to the foreign antigens that stimulated their production. This binding process can inactivate pathogens such as viruses or other microbial toxins, and set up the pathogens for destruction by innate immune cells.

Cell-mediated immune responses are the second class of adaptive immune response. In cell-mediated responses, activated T cells react directly against foreign antigens to either kill the infected cell or signal macrophages from the innate system to destroy the invader.

Immune memory is a central feature of the adaptive immune response. When B or T cells become activated, they multiply rapidly. When the immune issue becomes resolved, these cells stop dividing but are retained in the body as memory cells. If the same pathogen enters the body again, a memory cell is set to react and remove the pathogen before it becomes established.

Where Is Your Immune System Located?

Different components of your immune system are scattered throughout your body. Here are some of its primary locations.

SKIN

As mentioned earlier, your skin provides a mechanical barrier and is your first line of defense against pathogens. In addition, cells in your skin produce and secrete important antimicrobial proteins. Immune cells are located within specific layers of the skin.

BONE MARROW

Your bone marrow contains stem cells that can develop into a variety of different cell types. One type of stem cell in the bone marrow is the precursor to innate immune cells — neutrophils, eosinophils, basophils, monocytes, macrophages, mast cells, and dendritic cells — the first-line responders to infection by pathogens.

Another stem cell gives rise to adaptive immune cells — the B cells and T cells — that are responsible for adaptive immunity. Natural killer (NK) cells also are derived from stem cells and share features of both innate and adaptive immune cells. NK cells can respond to a wide range of pathogens and even cancer cells.



David Brownstein, M.D., is a board-certified family physician and one of the foremost practitioners of holistic medicine. Dr. Brownstein has lectured internationally to physicians and others about his success with nutritional therapies in his practice. His books include *Drugs That Don't Work and Natural Therapies That Do!*; *Iodine: Why*

You Need It, Why You Can't Live Without It; *Salt Your Way To Health*; *The Miracle of Natural Hormones*; *Overcoming Arthritis*; *Overcoming Thyroid Disorders*; *The Guide to a Gluten-Free Diet*; *B12 For Health*; *The Guide to a Dairy-Free Diet*; and *The Soy Deception*. He is the medical director of the Center for Holistic Medicine in West Bloomfield, Mich., where he lives with his wife, Allison, and their teenage daughters, Hailey and Jessica. For more information about Dr. Brownstein, please go to www.drbrownstein.com.

THYMUS

The thymus is a small organ located in the upper chest in front of the heart and behind the breastbone. Since T cells mature in the thymus, it plays an important role in adaptive immunity early in life. With aging, the thymus degenerates and becomes less functional.

LYMPHATIC SYSTEM

The lymphatic system is a network comprised of vessels carrying a clear fluid called lymph, and lymphoid organs such as lymph nodes. As a communication network between tissues and the bloodstream, the lymphatic system carries immune cells to about 600 lymph nodes clustered throughout the body in areas such as the neck, armpit, groin, and other locations.

Lymph nodes contain white blood cells, particularly lymphocytes. These nodes filter the lymph fluid as it passes through on its way towards the heart, and the lymphocytes serve to defend against any pathogens present. That is why doctors check for swollen lymph nodes, which may indicate an active immune response, infection, even the presence of cancer.

MUCOSAL TISSUE

Because mucosal surfaces are key entry points for pathogens, specialized immune hubs are strategically located in mucosal tissues like the gut and respiratory tract. The GI tract contains what is called gut-associated lymphoid tissue (GALT) to store T and B lymphocytes and protect against pathogens. The gut actually contains 70%-80% of the body's immune cells and produces more antibodies than the rest of the body combined.

SPLEEN

The spleen is an organ located on the left side behind the stomach. Many B lymphocytes are located in specific areas of the spleen, which can detect and defend against bacteria or other pathogens.

What Happens When There Are Problems With the Immune System?

When your immune system does not function

properly, serious — even fatal — illness may result. In general, disorders of the immune system fall into four categories:

IMMUNE DEFICIENCY DISEASES

Some children are born with a weak or deficient immune system. This is known as primary immune deficiency. Severe combined immunodeficiency (SCID) is an inherited disorder present at birth, in which the child shows defects in the B and T lymphocytes that defend against infection. This is also called “bubble boy disease” after the famous case of the boy who had to live in a sterile plastic bubble because he was too susceptible to the pathogens encountered in normal life.

Studies have shown that primary immunodeficiency in both humans and mice is associated with increased risk of cancer. Some researchers believe that a key function of the immune system is to prevent cancer. Cell types from both the innate (NK cells and macrophages) and the adaptive (T and B lymphocytes) immune systems appear to be involved in cancer control.

Human immunodeficiency virus (HIV) kills or severely damages the body's immune cells. In its advanced stages, it becomes AIDS or acquired immunodeficiency syndrome. There is no cure, but medications have allowed many people with HIV/AIDS to live with the disease, which can cause infections and cancers.

Temporary acquired immune deficiencies may occur due to certain drugs or medications. Chemotherapy and corticosteroids are examples of drugs which can weaken the immune system. Drugs given to those who have had organ transplants are another example. Certain infections such as mononucleosis may weaken the immune system temporarily. Removal of the spleen can also reduce immune function.

OVERACTIVE IMMUNE SYSTEM

With certain disorders, the immune system becomes overactive, reacting to things that are usually harmless.

Allergic reactions are quite common. About 18 million Americans suffer from allergic rhinitis

or hay fever. In this disorder, the immune system reacts to substances such as animal dander, pollens, dust mites, molds, grasses, or other things. The body mistakenly considers the substance a harmful, foreign invader.

Specific immunoglobulin E (IgE) antibodies are produced in response to the allergen. These IgE antibodies bind to mast cells in the immune system, which become activated. When this happens, the mast cell releases chemicals such as histamine, which causes inflammation. This is why you commonly see antihistamines sold as allergy symptom-relieving drugs. Once produced, IgE antibodies remain in the body and may trigger another allergic reaction if contact with the allergen occurs again.

The symptoms that develop depend on where the histamine is released in the body. Nasal congestion, itchy or watery eyes, and shortness of breath are symptoms of mast cells reacting in different parts of the body.

Anaphylaxis is a severe and potentially life-threatening allergic reaction. It may occur within seconds or minutes of exposure to certain allergens, such as a peanuts, shellfish, or insect venom. The flood of chemicals released by the immune system during anaphylaxis may lead to a drop in blood pressure, shock, and difficulty breathing. Anaphylaxis requires emergency treatment and an injection of epinephrine. Failure to receive immediate treatment for anaphylaxis may lead to unconsciousness or even death.

Allergic asthma is a chronic lung condition and the most common form of asthma. It is triggered by exposure to the same substances that trigger allergy symptoms. In people with this condition, breathing difficulties such as wheezing, chest tightness, and coughing may occur. Asthma requires ongoing medical management. Treatment of asthma often includes medications such as daily inhaled steroids to prevent symptoms and control the disease.

Eczema, or atopic dermatitis, is chronic skin inflammation that may be worsened by certain foods or environmental allergens. It is particularly common in children. With eczema, there is typically a breakdown of the skin barrier

and activation of the immune system in the skin, leading to inflammation and severe itching.

AUTOIMMUNE DISEASES

With an autoimmune disorder, your immune system cannot distinguish between healthy tissue and antigens. As a result, the body mistakenly attacks and destroys its own cells and tissues. There are more than 80 types of autoimmune disorders, which affect over 23 million Americans. Some of the most common include Type 1 diabetes, rheumatoid arthritis, and multiple sclerosis.

In Type 1 diabetes, the immune system attacks cells that make insulin, the hormone necessary for blood sugar control. With rheumatoid arthritis, the immune system attacks the joints. In multiple sclerosis, the immune system attacks the myelin sheath surrounding the nerve fibers, affecting the brain and spinal cord.

Scientists do not know exactly what causes autoimmune disorders, but there may be a genetic component. Women are at higher risk for some autoimmune diseases. Many people with autoimmune diseases take immunosuppressive medications to reduce the immune system's abnormal response. These can include corticosteroids such as prednisone and a number of other drugs.

CANCERS OF THE IMMUNE SYSTEM

Lymphoma is a type of cancer that develops in the lymph nodes and lymphatic system. There are two main types of lymphoma. Non-Hodgkin's lymphoma makes up approximately 90% of cases and usually affects those 60 and over. Hodgkin's lymphoma (about 10% of cases) typically strikes those in their 20s and then again after age 55. A primary symptom of lymphoma is swelling of lymph nodes that does not go away, as it typically does after infection.

Lymphoma affects the type of white blood cell cells called lymphocytes, which are immune cells. In non-Hodgkin's lymphoma, B cells and T cells are affected. In Hodgkin's lymphoma, the cancer cells are usually an abnormal type of B lymphocyte, named Reed-Sternberg cells.

Leukemia is a form of cancer that begins in

the bone marrow and results in an abnormal of white blood cells which are not fully developed. Because of this, leukemia patients suffer immune dysfunction and are at increased risk for infections. Leukemia affects either the lymphoid or the myeloid cells. Cancer that develops in the lymphoid cells is called lymphocytic leukemia and usually involves lymphocyte stem cells. Cancer that develops in the myeloid cells is called myelogenous leukemia and involves other white and red blood cell and platelet precursors. The disease can be either acute or chronic.

Factors Affecting Your Immune System

Aging has a huge impact on immune system function. In fact, immunosenescence is the term scientists use to refer to the immune system changes associated with aging.

With advancing age, some critical immune system functions become reduced, including cellular response and antibody production. The bone marrow may become less able to produce the stem cells that develop into immune cells. In the elderly, the immune system may also lose its memory for pathogens it has been exposed to and fail to recognize them when they reappear.

Older individuals are more susceptible to infection, cancer, and autoimmune diseases. Researchers believe this is at least partly explained by chronic inflammation, which is associated with many disorders of aging.

When you are young, your body can summon a vigorous immune response to pathogens such as viruses. Take the flu virus as an example. Among the elderly, the flu virus is associated with much higher rates of death and hospitalization compared to those who are younger.

There also appears to be a connection between nutrition and immunity in the elderly. Micronutrient malnutrition, in which there is a deficiency of some essential vitamins and trace minerals obtained from or supplemented by diet, is more common among the elderly. Older people also tend to eat less and have less variety in their diets.

However, dietary deficiencies are not only a problem for the elderly. Poor nutrition and

Simple Steps to Boost Your Immune System Function

- Avoid Smoking and Drink Alcohol In Moderation
- Exercise Regularly and Maintain a Healthy Weight
- Manage Your Stress Level and Emotional Health
- Get Enough High-Quality Sleep
- Consider Your Diet and Habits
- Consume Immune-Boosting Nutrients

vitamin/mineral deficiencies can reduce immune function and increase susceptibility to infection at any age. Studies show that vitamins and minerals exhibit important immune-modulating functions by entering cells and regulating gene expression. Certain minerals also reduce the oxidative stress affecting immune cells.

Psychological health has a large influence on the immune system as well. Certain disorders such as depression and anxiety can suppress immune system function. Chronic stress also has a negative effect on immune health.

Simple Steps to Boost Your Immune System Function

As you've seen, the aging process takes a toll on immune function. This makes it crucial to take steps to bolster your immune system as you grow older. Here are some simple immune-boosting strategies:

AVOID SMOKING AND DRINK ALCOHOL ONLY IN MODERATION

Both smoking and excessive alcohol intake can depress immune system function. Cigarette smokers are many times more likely to experience viral respiratory infections and show an altered immune response to bacteria. Excessive alcohol consumption can weaken host defenses and increase immune-depressing inflammation.

EXERCISE REGULARLY AND MAINTAIN A HEALTHY WEIGHT

Researchers are not exactly sure how exercise affects the immune system, but theorize that exercise affects antibodies and immune cells, slows down the release of stress-related hormones, and may help flush bacteria out of the airways and lungs.

The Secret to Digestive Health?

Next time you're at the grocery store, take a few seconds to appreciate the heft of a one-pound package of butter . . .

Because some researchers now believe you have an entire organ weighing two or three times that amount in your gut — an organ composed entirely of bacteria!

This structure, which scientists refer to as the “microbial organ,” contains about 100 trillion bacteria. Under optimal circumstances, most of these are considered “friendly” or probiotic bacteria, performing functions benefiting your digestive and immune health.

Unfortunately, and particularly with increasing age or even the use of certain drugs such as antibiotics, non-beneficial bacteria may begin to take over — and crowd out the friendly species. This causes an imbalance that can lead to common digestive concerns such as constipation or diarrhea, gas, bloating, and abdominal discomfort.

Finally, Put the Brakes on Bathroom Bothers

Fortunately, renowned holistic doctor **David Brownstein, M.D.**, counsels you don't have to live with backed-up or bothersome bowels — or other uncomfortable digestive concerns.

Dr. Brownstein recommends an all-natural solution to irregular bowel movements and other digestive issues: replenishing your supply of these beneficial gut helpers by supplementing

with proven strains of powerful probiotic bacteria.

This will actually help normalize the transit time of waste material in your colon — so you can have more regular and less uncomfortable bowel movements. And with a balanced digestive system, you experience less embarrassing gas and bloating, too.

Replenish ‘Friendly’ Bowel Bacteria for Gut & Immune Health

In his *Doctor's Guide to Probiotics and Your Health*, Dr. Brownstein reveals why yogurt and cheap probiotic supplements are just a waste of your hard-earned money. Plus, you'll see why high-quality probiotics can also be an invaluable asset to your properly-functioning immune system. And this Special Report, a \$20 value, is your gift from Dr. Brownstein.

Plus, you'll also get a complimentary 30-day supply of **Bactipro**®, a new breakthrough digestive and immune health probiotic formula Dr. Brownstein personally developed after seeing many of his patients suffering from simple digestive concerns.

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chosen specifically to help improve and maintain your normal digestive system and immune function. In fact, **Bactipro** specifically targets both your small and large intestine simultaneously, with proven Bifidobacteria and Lactobacillus strains.

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When it comes to maintaining your ideal weight, a recent Australian study demonstrated that even modest weight loss may reverse many of the damaging changes seen in the immune cells of obese people, particularly those with Type 2 diabetes. Researchers found that weight loss caused an 80% reduction of pro-inflammatory T-helper cells. It also led to decreased activation of other circulating immune cells.

MANAGE YOUR STRESS LEVEL AND EMOTIONAL HEALTH

Many studies have demonstrated that chronic stress, depression, and anxiety increase the production of pro-inflammatory chemicals in the blood, which in turn can depress immune system function.

In fact, so much research has been done on stress and immunity that it has its own field, called psychoneuroimmunology. While short-term stress (“fight or flight” responses) may actually benefit the immune system, chronic, long-term stress does not. One study involving subjects caring for spouses with Alzheimer’s showed that caregivers had a marked overproduction of an immune factor known as IL-6. Elevated IL-6 is associated with many age-related degenerative disorders, including heart disease, mental decline, arthritis, Type 2 diabetes, and certain types of cancers.

Research also shows that immune T cell activity is reduced in depressed patients compared with non-depressed patients. High levels of anxiety and social isolation are also associated with decreased immune function.

This makes it extremely important to maintain healthy social relationships, decrease stress levels, and seek counseling or professional help for emotional issues such as depression or anxiety.

GET ENOUGH HIGH-QUALITY SLEEP

Sleep exerts a profound influence on immune function. Good sleep enhances the formation of immunological memory, which enhances adaptive immune response. Most experts recommend seven to nine hours of good-quality sleep per night for adults.

Studies indicate that prolonged sleep loss is accompanied by immunodeficiency and elevated pro-inflammatory activity. Long-term sleep debt also increases your risk for diabetes, heart disease, and obesity.

CONSIDER YOUR DIET AND HABITS

It’s important to eat plenty of phytonutrient- and antioxidant-rich foods such as dark leafy greens, tomatoes, peppers, cruciferous vegetables such as broccoli, berries, and other colorful fruits.

Cook with garlic, which contains the potent pathogen-fighting ingredient allicin. Green tea contains an antioxidant called EGCG that has many healthful, immune-boosting properties.

As the majority of the immune system is located in the gut, using probiotics to boost the population of “friendly” intestinal bacteria is a smart idea. Dietary omega-3s help regulate immune function. Omega-3s are found in fish and leafy green vegetables.

Additionally, make sure you consume enough protein. Research has shown that a deficiency of high-quality protein can result in a reduction of immune cells, a decreased ability to make antibodies, and other immune-related issues. Good sources of protein include wild-caught fish such as salmon and organic eggs.

Foods to avoid include packaged and processed foods, sugar, trans fat and refined vegetable oils, and white flour.

You should also take steps to avoid infection, such as washing your hands frequently and cooking meats thoroughly.

Targeted Nutrients for the Immune System

- Beta Glucans
- Astragalus
- Olive Leaf Extract
- Zinc
- Vitamins A, C, E, and D

Many nutrients play a role in helping to maintain a robust immune system, or improve one that is operating at a sub-par level.

CONSUME IMMUNE-BOOSTING NUTRIENTS

Certain nutrients have been shown to boost immunity. They are so note-worthy, they deserve their own section.

Targeted Nutrients for the Immune System

Many nutrients play a role in helping to maintain a robust immune system, or improve one that is operating at a sub-par level. Here are a few important nutrients you should know about:

BETA GLUCANS

Beta glucans are naturally occurring polysaccharides which are not produced by the body. The only way to get them is through outside sources, which include baker's yeast and maitake mushrooms.

Researchers have been looking at beta glucans for over a century because of their ability to boost immune system function. As immunomodulators, they increase host immune defense by activating the complement system, enhancing the function of macrophages and natural killer cells. As you'll recall, macrophages are immune cells that ingest and destroy invading pathogens and stimulate other immune cells to attack as well.

Beta glucans help fight upper respiratory viruses including the common cold. Additionally, they are used to treat infections caused by bacteria which have become resistant to antibiotic treatment.

Researchers are examining the potential of beta glucans to inhibit tumor growth and prevent tumor metastasis. They are also being studied as an adjuvant treatment for those undergoing cancer chemotherapy and radiation.

Maitake mushrooms (*Grifola frondosa*) are known in Japan as the "dancing mushroom." With their beta glucan properties, maitake has been widely researched for its effects on the immune system, activating a host defense response by stimulating the proliferation of certain immune cells.

Several studies have demonstrated that maitake causes apoptosis or programmed suicide of cancer cells. It also helps impede formation of the blood supply necessary to feed tumors, and enhances the

ability of immune cells to destroy lung and breast cancer cells.

ASTRAGALUS

Astragalus is an herb that has been used in Traditional Chinese Medicine (TCM) for thousands of years. It is considered an adaptogen, meaning it helps protect the body against physical, mental, or emotional stress.

As an antioxidant, astragalus helps protect and support the immune system. With antibacterial, antiviral, and anti-inflammatory properties, astragalus can help prevent colds and upper respiratory illness. Studies indicate that astragalus may also help reduce symptoms of allergic rhinitis or hay fever.

Researchers have studied astragalus as a possible treatment for people whose immune systems have been compromised by cancer chemotherapy or radiation. And while more research is needed, astragalus may have anti-tumor affects.

Findings indicate it can help lower blood pressure and blood sugar. Preliminary research also suggests that astragalus may help improve heart function and support kidney function.

OLIVE LEAF EXTRACT

In the Bible, the olive tree is known as the "tree of life." No doubt you've heard of the heart-healthy Mediterranean diet, which includes olives and olive oil.

However, a unique molecule known as oleuropein — a potent polyphenol antioxidant — has been isolated from the leaf of the olive tree. This compound is responsible for the majority of olive oil's antioxidant, anti-inflammatory, and disease-fighting qualities.

By suppressing inflammation and reducing the damage done by oxidative stress, olive leaf extract may help protect the brain and nervous system from cognitive decline and age-related degenerative conditions such as Alzheimer's and Parkinson's.

Olive leaf extract inhibits DNA damage from oxidative stress, which is the first step in preventing cancer. Research also indicates that, with potent inflammation-fighting properties, oleuropein can help deter the growth of cancer that has already

developed. Oleuropein also inhibits certain enzymes that cancer cells use to gain the energy they need to grow and to metastasize.

Both animal and human studies suggest that oleuropein can help lower blood pressure, in part by fighting endothelial cell dysfunction. The polyphenol compounds in olive leaves can also help reduce platelet aggregation, reducing the risk of clots that could result in stroke or heart attack.

Promising animal studies suggest that olive leaf extract may help lower blood sugar and reduce hemoglobin A1c levels, one measure of diabetes.

ZINC

Zinc is a trace element essential not only for the immune system, but for the nervous and reproductive systems as well. Zinc is critical for proper human growth and development.

Zinc is a cofactor in more than 300 enzymes influencing immune system effects. Research indicates that zinc can reduce the severity of the common cold, and may shorten its duration.

Zinc deficiency is linked to DNA damage and impaired function of the immune system, in part because of reduced T lymphocyte and B lymphocyte function. Zinc has demonstrated an ability to decrease inflammation and the production of IL-2, a protein that regulates the activity of white blood cells responsible for immunity.

Older individuals are at risk of developing zinc deficiency because they get less zinc in their diets, and have a decreased ability to absorb the zinc they do consume.

VITAMIN A

With its hormone-like and antioxidant properties, vitamin A plays a central role in immunity to infectious diseases.

Vitamin A deficiency is associated with impaired immunity and increased risk of death from GI and respiratory infections.

Vitamin A deficiency impairs innate immunity by impeding the regeneration of mucosal barriers damaged by infection, and by reducing the function of neutrophils, macrophages, and natural killer cells. Vitamin A is also required for adaptive

immunity. It plays a role in the development of immune cells such as T helper cells and B cells, and is necessary for the generation of antibody responses to specific antigens.

Because it plays such an important role in maintaining structural integrity of the mucosal immune barriers, a deficiency of vitamin A increases risk for infections of the eye, GI tract, genitourinary tract, and respiratory system.

VITAMIN C

Vitamin C (ascorbic acid) plays a key role in the immune system and antioxidant defense system. It protects against the production of free radicals and lessens DNA damage in immune cells, affecting both innate and adaptive immunity.

Vitamin C stimulates production and function of certain white blood cells that affect immunity, particularly lymphocytes, neutrophils, and phagocytes. Animal studies indicate that supplemental vitamin C increases antibodies and immune complement proteins in the blood. Additionally, vitamin C reduces the production of pro-inflammatory cytokines and participates in recycling vitamin E.

Humans are unable to synthesize vitamin C when stores are low, so it must be obtained via diet and supplementation.

VITAMIN E

Vitamin E is a fat-soluble antioxidant with anti-inflammatory effects. Vitamin E protects and stabilizes cell membranes of immune cells by trapping free radicals, and enhances lymphocyte function. It also improves the binding of antigen-presenting cells and T cells.

A 2006 study of 29,000 male smokers, published in the *American Journal of Clinical Nutrition*, indicated that higher circulating blood levels of vitamin E were associated with lower risk of death from all causes. Deaths were significantly lower for those with lung and prostate cancer, respiratory disease, and stroke. Because of its ability to scavenge free radicals and inhibit the oxidation of LDL cholesterol, vitamin E may also aid in the prevention of cancer and atherosclerosis.

Unfortunately, deficiency of this crucial immune-boosting vitamin is common. A study reported in the Journal of the American Dietetic Association found that only 8% of men and 2.4% of women in the United States met the new Estimated Average Requirements (EARs) for vitamin E intake from foods alone.

Research indicates that a variety of age-related changes in human immune system function could be reversed by ingesting more vitamin E than can be consumed by diet alone. Elderly individuals can enhance their immune response, particularly their T lymphocyte function, with supplemental vitamin E.

VITAMIN D

Vitamin D operates as a steroid hormone with many functions. It regulates gene expression and functions in bone metabolism. Vitamin D's active form modulates both the innate and adaptive parts of the immune system.

Vitamin D stimulates immune cell proliferation and regulates the production of inflammatory cytokines, which helps protect against infections. It also regulates an important antimicrobial protein that can kill pathogens and enhance immunity. Vitamin D has effects on monocytes, B cells, T cells, and immunoglobulin secretion.

Many studies have associated lower vitamin D levels with increased infection. Both adults and children with higher vitamin D levels suffer substantially fewer cases of colds, flu, and other viral infections.

Vitamin D deficiency has also been linked to autoimmune disease such as Type 1 diabetes, rheumatoid arthritis, lupus, multiple sclerosis, and others.

Final Thoughts

As you've now discovered, your immune system works 24 hours a day, going largely unnoticed, to protect you from millions of pathogens and foreign invaders. Adopting healthy lifestyle habits and using targeted nutrients is your best strategy to maintain this hard-working defensive system at peak efficiency. ■

6 Ways to Keep Your Immune System Healthy

1

Wash your hands regularly.

Proper hand washing is the most effective barrier against the spread of infectious diseases.



Get plenty of sleep.

Your immune system is busy re-building and repairing itself while you sleep.

2

3

Take a probiotic.

Your immune system is busy re-building and repairing itself while you sleep.



Exercise regularly.

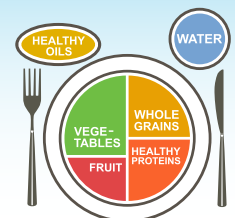
Physical activity helps you excrete germs and pathogens through the sweat glands.

4

5

Eat a healthy diet.

Poor nutrition can actually increase your chances for viral infection.



Take antioxidants and immune-boosting nutrients.

Antioxidants Vitamins A and C, plus Vitamins D, E, and Zinc provide immune support for the whole body.

6

Experience Vitality with ALPHA32™

An Antioxidant-Based Multivitamin to Support Your Health

- B Vitamins to Promote Energy Production
- Vitamin D for Bone Health
- Maitake Mushroom Extract for Added Immune Support
- Multiple Antioxidants, Including Vitamins A, C, E, Lutein and Lycopene
- Herbs, Such as Fenugreek, Thyme, and Sage
- Iodine for Thyroid Support
- An Antioxidant-Based Fruit and Vegetable Blend
- Minerals Such as Magnesium, Chromium, Zinc, Calcium, Selenium, and More



In a perfect world, you'd easily be able to get all the quality nutrients you need from diet alone.

However, the majority of Americans may not be getting optimal levels of necessary vitamins and minerals solely from what they eat — less than 12 percent of Americans score well on the Healthy Eating Index, a guideline used to determine the percentage of the population that actually meets established nutrient recommendations. In particular, a 2005 government survey revealed that many adults may not get sufficient amounts of vitamins A, C, E, magnesium, and calcium.

Additionally, the aging population has changing nutritional needs. Those over 50 may have a reduced ability to absorb certain nutrients from food. Another issue to consider: Some medications may also prevent proper absorption of vitamins and minerals.

Harvard Study: Multivitamins a Safe, Inexpensive Way to Support Your Health

Researchers from Harvard reviewed 35 years' worth of vitamin research. In a 2002 study published in the *Journal of the American Medical Association*, they reported that daily multivitamins offer a safe, inexpensive way to supplement nutritional needs in order to support health.

And while vitamins are not a substitute for healthy eating,

Dr. David Brownstein, one of the nation's top practitioners of holistic medicine, advises: "Everybody can benefit from the right multivitamin. I check all my patients for nutritional imbalances, and the vast majority of patients — both sick and well — have nutritional deficiencies. A daily multivitamin offers added support that can make a real difference."

Choose a Quality Multivitamin

ALPHA32 is a comprehensive antioxidant-based multivitamin that promotes health, vitality, and overall well-being. To help cover those nutritional gaps, ALPHA32 contains a doctor-endorsed formula of broad nutritional support for your immune system, brain and cardiovascular health, bone health, eye health, and energy production. Plus, ALPHA32 uses the special process of enteric coating for improved nutrient absorption and bioavailability.

Try Out ALPHA32 for a Full Month — Just Cover \$4.95 Shipping Fee!

Right now, you are eligible to try a risk-free 30-day supply of ALPHA32 (a \$39.95 value) with enrollment into our convenient Smart Ship program. You just cover a small shipping charge of \$4.95. To claim your own bottle of ALPHA32, please sign up online, or call the toll-free number below.



Medical Advisory Team:
Dr. David Brownstein, Dr. Erika Schwartz,
Dr. Chauncey Crandall, and Dr. Russell Blaylock

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