Your Immune System: Simple Approaches to Keeping It Strong

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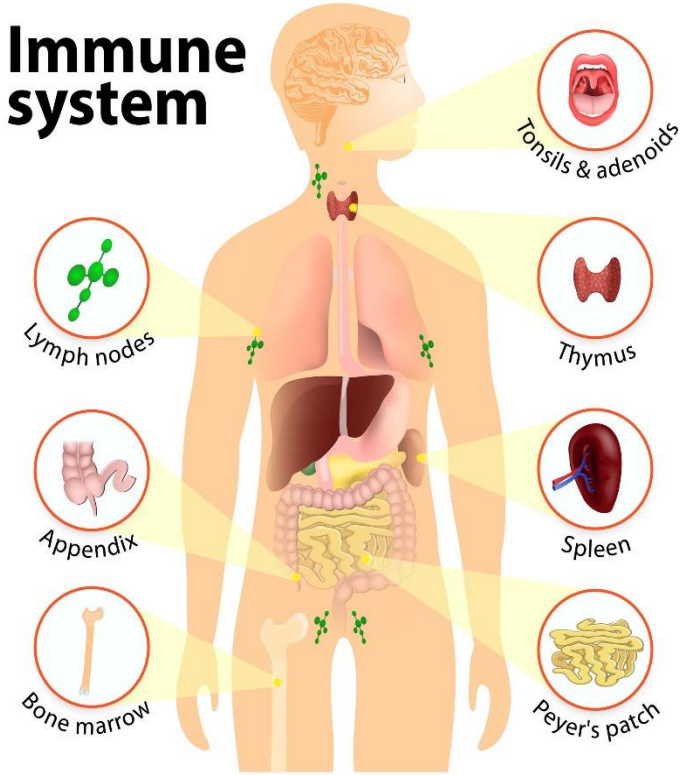
Your Immune System

Your immune system is an extremely complex network of organs, tissues, cells and proteins that are critically important for fighting off infections and keeping you well. **It has three main functions:**

1) Identifying and eliminating foreign invaders including bacteria, viruses, parasites, fungi and other pathogens.
2) Recognizing and neutralizing harmful substances from the environment.
3) Locating disease-causing changes in the body - such as cancer cells - and destroying them.

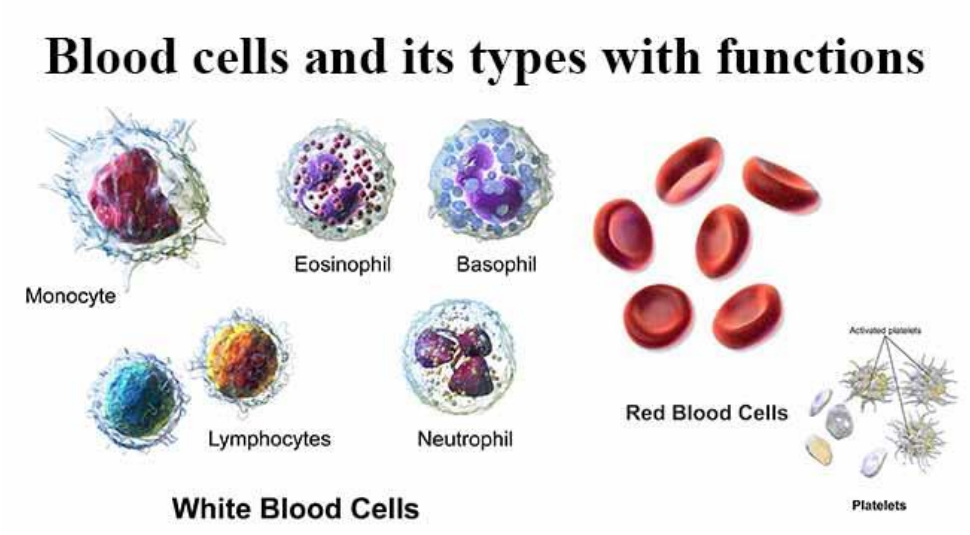


The main parts of the Immune System are:

- White blood cells
- Antibodies
- The Complement System
- Lymphatic system
- Spleen
- Thymus
- Peyer's patches in the wall of the intestine
- Bone marrow.

White blood cells (WBCs)

White blood cells are **also called leukocytes**. These are the main players of your immune system. In addition to red blood cells and platelets, white blood cells are identified as five major types.



1) **Monocytes.** These cells help to break down bacteria and have a longer lifespan than many other types of white blood cells.

2) **Lymphocytes.** These cells create antibodies to fight against bacteria, viruses, and other potentially harmful invaders.

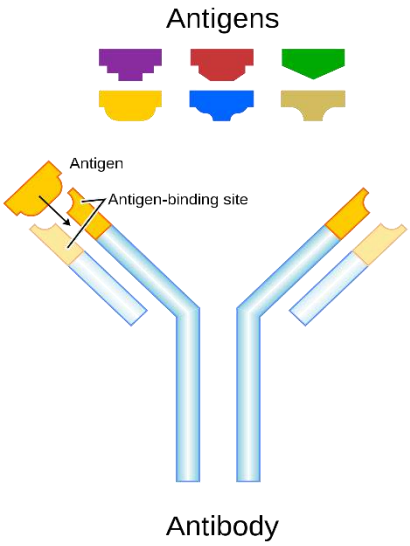
3) **Neutrophils.** The most numerous of all the types of WBCs, they are your first line of defense when infection strikes. They kill and digest the foreign invaders such as bacteria and fungi.

4) **Basophils.** These small cells sound an alarm when infectious agents invade your blood by secreting chemicals such as histamine, a marker of allergic disease that helps to control the body's immune response.

5) **Eosinophils.** These cells attack and kill parasites and cancer cells and help with allergic responses.

Antibodies

These are special protein molecules that the immune system produces in response to antigens. Antigens are **proteins found on foreign invaders.** Antibodies are produced by B cells, also called "B lymphocytes", which are **made in bone marrow** and are found in the blood and lymph.



Antibodies have a distinctive Y shape, which is key to how they work. Antibodies (*Ab*) are also referred to as *immunoglobulins* (*Ig) and* are found in plasma (the liquid part of blood and lymph), other body fluids, and in the membranes of certain cells.

There are five classes of *immunoglobulins*, which can be described by where they are found and what their function is:

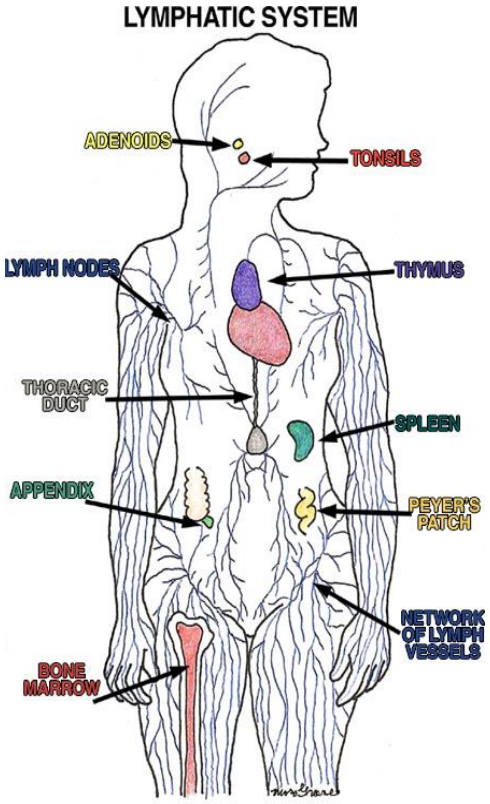
1. IgA (***immunoglobulin A***)**:** found in breathing and digestive passages as well as in saliva, tears, and blood, among other places; helps protect surfaces that are exposed to foreign substances from outside the body
2. IgD (***immunoglobulin D***)**:** found in cells in tissues in the chest and belly; function as receptors; least understood of the immunoglobulins
3. IgE (***immunoglobulin E***)**:** found in lung, skin, and mucous membranes; help expel parasites in the intestines and are involved in allergic reactions
4. IgG (***immunoglobulin G***)**:** found in all body fluids; critical to fighting infections from viruses and bacteria; only antibodies that can pass over the placenta from mother to fetus; most common but smallest antibody
5. IgM (***immunoglobulin M***)**:** found in blood and lymph fluid; first antibody to respond to an infection; largest antibody

The Complement System

Also known as the **complement cascade**, this system is a part of the immune system that **enhances** (complements) the ability of antibodies and phagocytic cells to clear microbes and damaged cells from an organism, promote inflammation, and **attack the pathogen's cell membrane**.

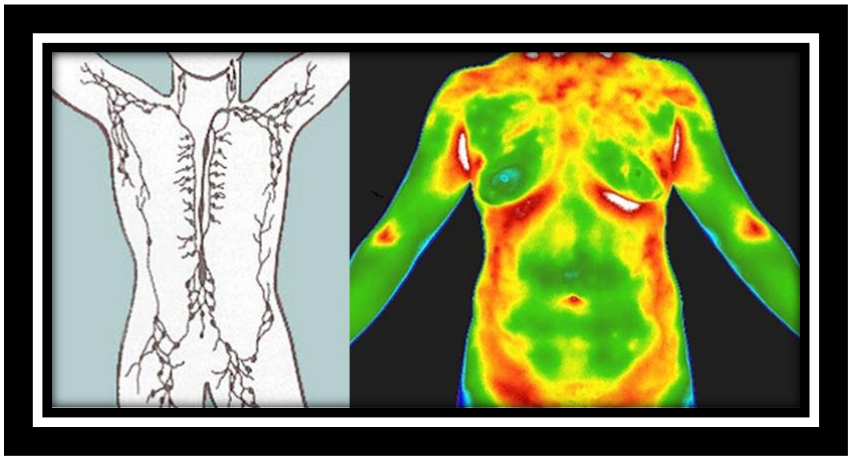
The Lymphatic System:

A system of vessels, cells, and organs that carries excess fluids to the bloodstream and filters pathogens from the blood. It is the **largest circulatory system in the body** and is involved in digestion, detoxification, and delivery of nutrients, especially fats. It also transports immune cells to where they may be needed. **A lymph node is a small bean-shaped organ** located throughout the lymphatic system where immune cells gather, because pathogens tend to be filtered there. Lymph nodes also serve as a major staging area for the development of critical immune responses.

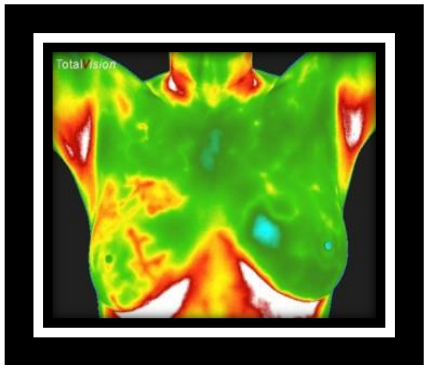


The lymphatic system can become overwhelmed and congested due to poor digestion; leaky gut syndrome, **which allows undigested proteins like gluten and casein, and toxic fats to enter into the lymph**; and environmental toxins such as pollutants, pesticides, preservatives and heavy metals. Because 70% to 80% of the immune system is in the gut, when the lymph that drains it becomes congested, immunity is compromised ***(See brochure: "Healing Digestive Problems and Leaky Gut")***

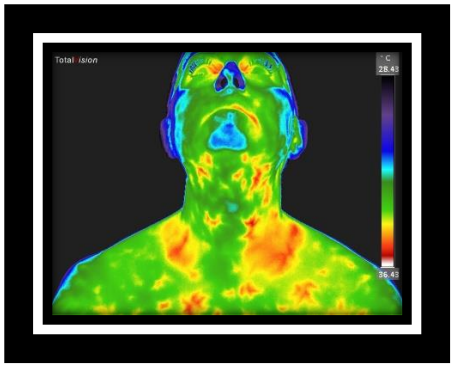
Lymphatic congestion can be seen by Medical Thermography. Here are a few examples:



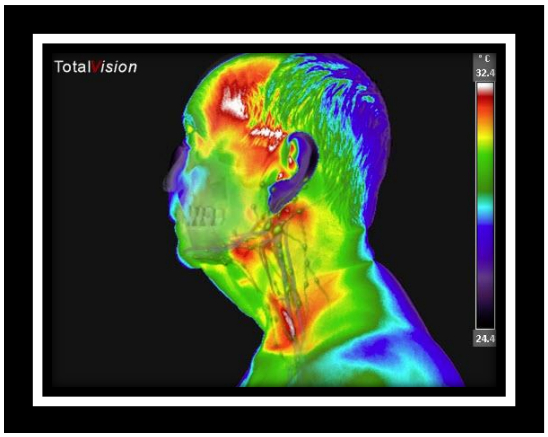
Lymphatic Channels of Inflammation - Abdomen



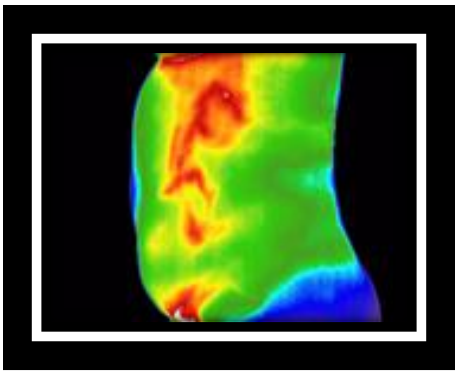
Breast Lymph Congestion



Lymph Congestion - Dental



Lymph Channels in the Neck



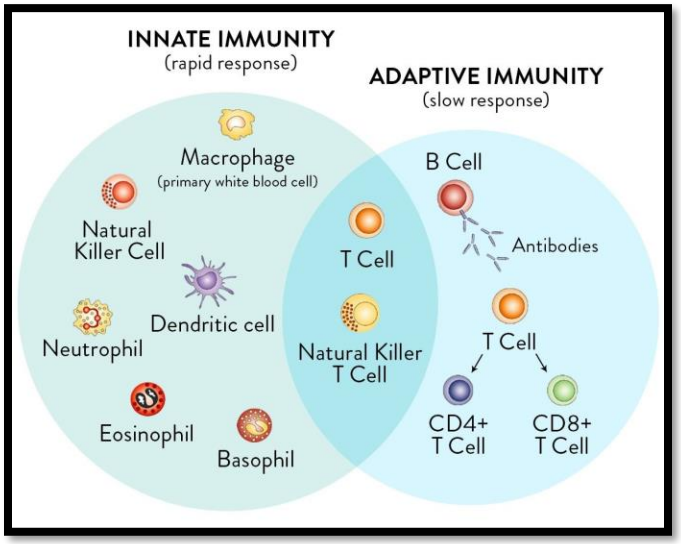
The Spleen: Located in your upper left abdomen behind your stomach, your spleen's main function is to filter your blood and recognize and remove old, malformed, or damaged red blood cells. It also plays a significant role in your immune system by identifying foreign invaders, such as bacteria and viruses, and mounting a response against them by creating lymphocytes, a type of white blood cell that produces antibodies.

The Thymus: The thymus gland is a small organ located below the sternum (breastbone) and above the heart that plays an important role in the immune and endocrine systems. It produces and secretes a hormone, called thymosin, which is necessary for the development and production of **T-cells** —a type of WBC in the immune system that helps to destroy infected or cancerous cells. The thymus gland contains a number of other types of WBCs including dendritic cells, B lymphocytes (the types of lymphocytes that produce antibodies) and macrophages, which are known as the "garbage trucks" of the immune system because they eat foreign matter. The thymus is special in that, unlike most organs, it is at its largest in children. Once you reach puberty, the thymus starts to slowly shrink and become replaced by fat.

Peyer's Patches: These are small masses of lymphatic tissue found throughout the ileum region of the small intestine. **Also known as "aggregated lymphoid nodules"**, they form an important part of the immune system by monitoring intestinal bacteria populations and preventing the growth of pathogenic bacteria in the intestines. In addition, the colon has a network of lymphoid tissues referred to **as "solitary intestinal lymphoid tissues" (SILT)**. SILT and Peyer's patches are responsible for up to 70 to 80% of the immune system.

Bone Marrow: This is the spongy tissue found inside your bones. It produces **red blood cells** that carry oxygen to all the tissues in your body, **white blood cells** to fight infections and **platelets** to aid in blood clotting.

Immune Responses



There are two different types of immune responses referred to as "innate" and "adaptive". **Innate:** This is an **immediate immune response** caused by a variety of white blood cells that are constantly circulating in the blood searching for foreign invaders. They can attack immediately, and therefore are considered the first responders.
Adaptive: This is a delayed response that involves immune cells finding a foreign invader and then making a specific antibody against it.

Keeping Your Immune System Strong:

As you age, your immune system gradually loses its strength, **which makes anyone over 60 years of age more susceptible to infections**. The good news is, there are a number of simple diet and lifestyle approaches as well as nutritional supplements that can help you support your immune system and lower your risk of contracting illnesses, including the flu and upper respiratory tract infections such as the unusually contagious virus we are all facing right now.

A Strong Immune System Begins with a Healthy Diet and Lifestyle

Diet: Research shows the most health-promoting diet is one that is primarily plant-based. So, fill your plate with lots of fresh organic, colorful fruits and vegetables because they are packed full of vitamins, minerals and certain substances, called phytochemicals, that act like natural medicines.

Regular Exercise: Studies show that you can get most of the health-benefits that exercise has to offer by as little as 30 minutes of brisk walking a day.

Quality Sleep: The keys to good quality sleep include not only the number of hours you sleep each night (7 to 8 hours are ideal), but of equal importance is the exact times that you sleep. **Going to bed before 10 PM and rising before 6 AM appear to be the magic hours.** Studies show that if you sleep during these times, you experience the deepest most immune-boosting states of sleep. If you stay up much later, such as midnight on a regular basis, it stresses your body, causes imbalances, and weakens your immune system.

Reducing Stress: Because stress is **one of the most powerful destroyers of your immune system**, it is extremely important to minimize its damaging effects through the daily practice of an effective stress-reducing technique such as mediation, Tai chi, Qi gong or yoga. If you've never learned one of these techniques—no problem, YouTube has many videos that can show you how.

Supplements that Support Your Immune System

Research shows there are several **key nutrients** that can be taken as a dietary supplement including certain vitamins, minerals, amino acids, mushroom extracts, and herbs that can help to support and strengthen your immune system. Here are the top immune-supporting supplements you should consider taking:

Vitamins C and D
Vitamins C and D are particularly important for your immune system. Studies show that a deficiency in either of these vitamins causes **impaired immunity and higher susceptibility to infection,** including the flu and upper respiratory tract infections.
Vitamin C: Supplementation with vitamin C appears to both help prevent and treat respiratory and systemic infections, **including coronavirus-type infections**. The recommended dose of vitamin C is 1,000 mg a day. Because vitamin C is water-soluble and does not store in the body, experts recommend 1,000 mg up to three times a day, especially when your immune system is challenged.

Vitamin D: Unlike vitamin C, vitamin D is fat-soluble and can store in the body. A chemical reaction occurs between the ultraviolet rays of the sun and the human skin that manufactures vitamin D3. Unfortunately, most Americans do not get enough sun exposure throughout the year to create enough vitamin D3. **In fact, studies show 80-90% of Americans are deficient in this vitamin.**
Vitamin D3 is essential for the proper functioning of every cell in your body, including your immune system. That's why the health consequences of being deficient in vitamin D3 are much greater than you might imagine. The risk of a wide variety of diseases, ranging from neurological problems to cancers, increase dramatically. Your risk of infections also significantly increases. **This appears to also be true for COVID-19.** A recent study conducted by Northwestern University found that COVID-19 patients who are severely

deficient in vitamin D are **twice as likely to experience severe complications**, including death. For those whose levels are in the ideal range (40-60 ng/ml), the risk of those diseases is minimal.
The only way to know how much vitamin D you should be taking is to **test** your levels. You don't have to go to a doctor's office for this test. There is an at-home vitamin D test kit you can order from **www.nutrientpower.org**.

The kit arrives at your home with instructions. Shortly after you send your sample back, you will receive an email with your results. If your levels are very low, you will want to take the higher doses of vitamin D determined by the vitamin D calculator that can be found on that site. Be sure to re-check your levels in a few months.

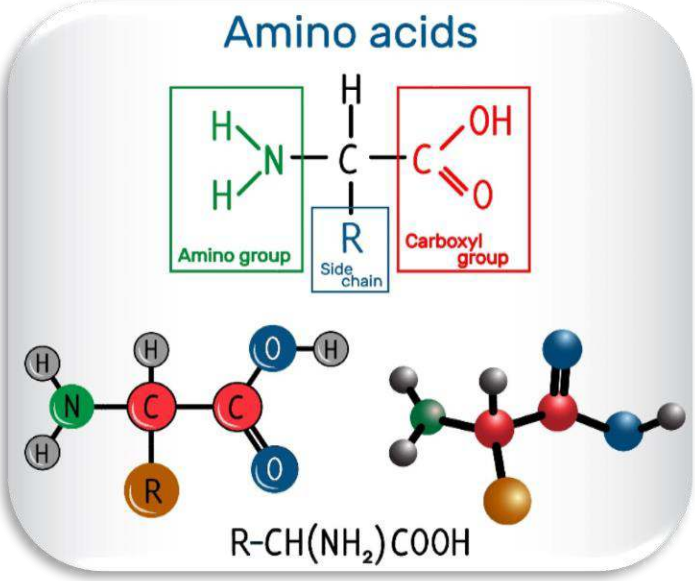
B Complex Vitamins

Vitamin B6 is essential to keeping your immune system in top condition. Be sure to get enough of the various types of vitamin B as a supplement, as part of your daily diet (you can easily get your daily intake from fortified cereals) or in a multivitamin.

Amino Acids

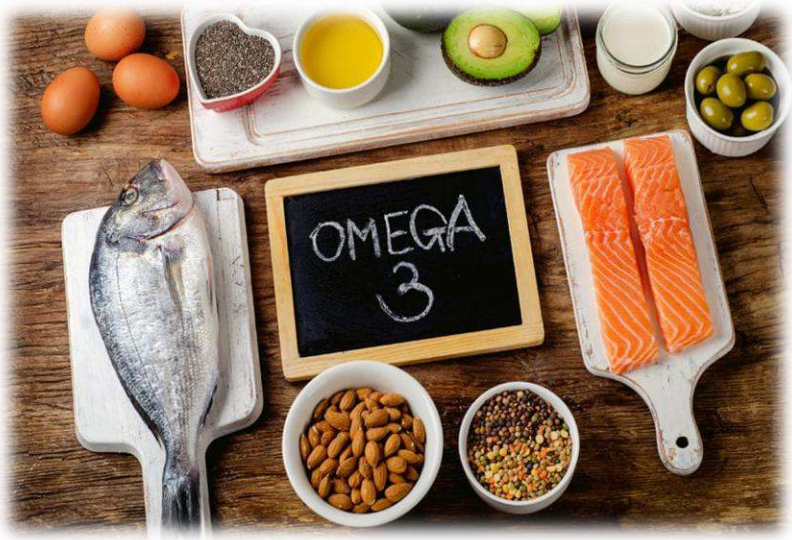
According to the ***British Journal of Nutrition***, a deficiency of dietary protein or amino acids impairs immune function and increases the risk of infectious disease. Amino acids play a major role in protein synthesis and the formation of white blood cell and antibodies, which your body's immune system uses to help fight off foreign invaders, like bacteria and viruses. Your muscles act as a reservoir of amino acids. As you age, you lose lean muscle

every year, which not only causes you to become physically weaker, but it also can impair your immune system and increase your susceptibility to illnesses. Studies show that if you take a specific combination of amino acids as a supplement**, it not only supplies your immune system with the nutrients it needs, but it also helps to prevent muscle loss**. An amino acid supplement, called ***Rejuvenate*,** consists of the exact combination of essential amino acids—including higher concentrations of leucine, valine and isoleucine—shown in the studies to be most effective.



Omega-3 Fatty Acid

Omega-3 fatty acids may help to **boost the immune system** by enhancing the functioning of immune cells, including the activity of white blood cells known as B cells.



Recommended daily amounts are at least **2,000 mg/day**. Blood levels should be between 8% and 12%.

Minerals

Zinc

Your immune system cannot function well without adequate amounts of the minerals zinc, copper and selenium. Zinc not only helps immune function, but it has also been **shown to prevent the replication of viruses inside cells and can decrease the duration of colds.** Zinc lozenges are especially effective as reported in a study published in the *Annals of Internal Medicine*. Zinc lozenges should not be taken for more than 5 to 7 days because it may cause a copper deficiency, which can dangerously impair immune function. The recommended daily dose is **9-11 mg/day**. If you feel symptoms beginning you can significantly increase the dose to 9-23 mg of zinc every 2-3 hours or 75mg/day, but you should not take this amount longer than a week.

Copper

The link between copper and innate immune function has been recognized for decades. The immune system requires copper to perform several functions, of which little is known about the direct mechanism of action. Mild copper deficiency in humans and animals are characterized by neutropenia or a low white blood cell count. The **recommended daily allowance is around 900 micrograms (mcg) a day** for adolescents and adults.

Selenium

Selenium is an essential micronutrient found in the soil that plays a crucial role in wide variety of physiological processes, including effective immune responses. **Viral and bacterial infections are often associated with deficiencies of selenium,** as well as an increased incidence of influenza viruses mutating to highly pathogenic strains. **Recommended daily amount is 200 mcg.**

Medicinal Mushrooms

Of all the food groups, **medicinal mushrooms have the strongest immune-supporting properties.** You can eat them, but in all practicality, you are not going to eat them every day in the dose that is needed to be effective. This is an example of why taking nutritional supplements can be important. **Taking a medicinal mushroom supplement every day is a simple and easy way to help keep your immune system strong.** One of the most effective formulas is made from an extract from a blend of cultured *Lentinula edodes* mushrooms, called active hexose correlated compound (AHCC). Research shows that AHCC has a multitude of beneficial effects on a variety of cells in the immune system including improving the activity of natural killer (NK) cells, dendritic cells, macrophages, and T-cells, along with having antioxidant and anti-inflammatory effects. The effects of AHCC on resistance to viral and bacterial infection have been well studied in animals, especially in response to influenza virus. **The recommended dose is at least 500 mg twice a day, up to 3 grams/day in divided doses.**

Astragalus

The root of the herb, astragalus, has been used for thousands of years to strengthen the immune system. It has also been used to fight infections caused by bacteria and viruses including the common cold, upper respiratory infections, seasonal allergies, and the swine flu. **Studies have found 160 mg of astragalus root extract daily to be effective.**

Curcumin

Curcumin is derived from the *Curcuma longa* plant, commonly known as turmeric. Curcumin is used in Ayurvedic and Chinese medicine for its analgesic, anti-inflammatory, and antiseptic activity. Curcumin can help fight inflammation and aid the body's immune response, as found by a study published in *Molecules*. ***Recommended daily doses are 1,000 to 2,000 mg/day.***

Garlic

Garlic has been used as an antiseptic, antibacterial, and antifungal agent. It may help the body resist or destroy viruses and other microorganisms. Garlic can boost your immune system by increasing the rate at which your natural killer cells are made.

Green Tea

Polyphenols, potent plant antioxidants, are what's believed to give green tea its immune-boosting effects. One laboratory study suggested that a particular type of polyphenols called catechins may **kill influenza viruses**.

A Healthy Foundation

Supplements, as their name implies, **are meant to be used in addition to a healthy diet and lifestyle**. For immune-boosting supplements to work well, you must provide your body with high-quality nutrition and engage in health-promoting daily habits, including regular exercise, adequate sleep, and meditation or other stress-reducing techniques such as yoga. If you eat a lot of processed foods, refined carbohydrates and sugar; stay up too late at night; drink excessive alcohol; smoke cigarettes; and are inactive, your immune system will be so severely weakened that **no supplements will be able to counteract that damage.**

"One of the big takeaways of the COVID-19 pandemic *is the importance of immune system strength.* ***You should be working on your immune system daily,*** *not just when you are getting older or feeling run down and sick. By making sure your diet and lifestyle is as healthy as possible and supplementing with key vitamins (C and D), minerals (zinc, copper, and selenium), amino acids, and the mushroom formula AHCC you'll be much better prepared to face any future disease challenges."*

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