



WHAT YOU NEED TO KNOW ABOUT YOUR IMMUNE SYSTEM

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Welcome to What You Need to Know About Your Immune System. In this eBook you will learn:

- A basic overview of the immune system – the organs and what they do.
- The four-step process of how the body defends itself from an invader, using a virus as an example.
- How the food we eat, and other environmental factors affect the immune system.
- The primary food sources of four key minerals and three key vitamins that support the immune system.
- A special Appendix specifically devoted to the coronavirus with recommendations from leading practitioners on how to best protect yourself and your family.

The Immune System: Basic Overview

The immune system. This term is frequently used to describe one of the major functional systems of the human body. There are slight differences among anatomy textbooks regarding its specific components. Some texts include the Lymphatic System as part of the Immune System while others treat them as separate systems. In wholistic circles, the entire body is considered the “immune system” because ultimately all bodily functions and systems influence immunity and play a role in overall health.

The immune system has two roles: to kill and to remember. Pathogens release certain chemicals and proteins that our immune system recognizes as not part of us which triggers a kill response. Once this occurs the system “remembers”, and we can reduce the impact of future attacks of a similar pathogen and thus have “immunity.”

We also view the immune system as having two main components. The primary or innate immune system and the secondary or acquired immune system. The innate immune system is for immediate response to pathogens. The acquired immune system develops after. It creates highly specific antibodies for foreign (“not self”) or body (“self”) proteins (antigens). How the immune system works is illustrated on page 3 in the section *The Immune System in Action*.

Immune System Components and Functions

The lymphatic system plays a major role in the immune response. This is why some texts include it as part of the immune system. The primary organs of the lymphatic system are the thymus gland and the bone marrow. The secondary organs are the lymph nodes, spleen, tonsils, liver, Peyer’s patches in the small intestines, and appendix.

The thymus gland is located beneath the breastbone and is the place where T cells mature. T-cells are a form of white blood cells that recognize and attach to foreign molecules (antigens). There are several types of white blood cells which have different and specific purposes. White

blood cells are made in the bone marrow. Bone marrow also produces red blood cells and platelets. The different types of white blood cells are lymphocytes, neutrophils, monocytes, eosinophils, and basophils.

There are two types of lymphocytes – T cells and B cells. T-cells are a form of white blood cells that recognize and attach to foreign molecules (antigens). B-cells make antibodies. Antibodies are special proteins that latch onto foreign substances inactivating them or marking them to be destroyed by other immune cells. Natural killer (NK) cells are a type of T-cell - the first line of defense for the body versus an infection. Lymphocytes migrate to areas of inflammation throughout the inflammatory process. Remember that infection produces inflammation.

Phagocytes are immune cells that engulf and digest foreign particles. They follow the lymphocytes into battle. The lymphocytes have marked the invaders for destruction. The phagocytes complete that task. The most important phagocytes are neutrophils and monocytes. Neutrophils are the first to respond to an infection. They will be elevated at the onset of an infection and decrease as the body fights the infection. They are the primary defense against microbial infections and respond to inflammation.

Monocytes are the body's second line of defense against infection. They will remove dead cells, microorganisms, and other waste materials from circulating blood. Monocytes tend to be elevated towards the end of the infection. They will stay elevated due to high levels of inflammation, during an extended recovery from an infection, and in cases of extended infection such as parasitic infections.

Eosinophils help to remove and breakdown the by-products of protein catabolism. They can ingest antibody-antigen complexes and are active in the later stages of inflammation. They are not effective against bacteria but do respond to allergic and parasitic issues. Eosinophils will remain elevated in cases of intestinal parasites or food or environmental sensitivities. They are phagocytes that contain histamine, heparin, and serotonin.

Basophils also contain histamine, heparin, and serotonin. They play an important role in the inflammatory process by releasing heparin and other substances to prevent clotting in the inflamed tissues. They will often be elevated in cases of continued inflammation and allergies.

On a side note: Most blood tests will include what is known as the WBC (white blood cell count) and differential. The differential is the composition by type of white blood cell and adds up to 100%. Many times, a client will be told that their blood test results are "normal." However, in truth, their lab results are far from optimal. When taking a closer look at a client's WBC and differential we often find the patterns of either acute or chronic infection or inflammation which supports the findings of my nutrition response testing.

Lymph is a fluid that contains lymphocytes, proteins and some fatty molecules formed from the fluid around the body's cells. Its function is to filter this material and return it to the blood stream. The lymph removes waste materials from cells, so they can be disposed of properly by the body. The material moves through lymphatic capillaries and lymphatic vessels on its way back to the circulatory system. The lymph nodes are where the lymph is filtered and purified.

The spleen filters the blood and lymph. It removes old red blood cells and destroys bacteria. The tonsils protect us against bacteria that enters via the nose and mouth. The liver produces half of the lymph in the body and stores and detoxifies blood. The Peyer's patches monitor intestinal bacteria populations and prevent the growth of pathogenic bacteria. The appendix makes antibodies.

The Immune System in Action

Following is a basic example of how the immune system works to defend the body against a virus with a four-step process. Steps 1 and 2 illustrate the innate immune system while steps 3 and 4 the acquired.

1. The invading virus is detected by white blood cells called macrophages. These cells are also known as the "frontline defender". As they encounter a foreign organism such as a virus, they begin to destroy the antigens or toxins produced by the virus. These activities are noticed by helper T-cells. They have identified that the macrophages need more help, so they signal the spleen and lymph nodes to produce additional cells to help fight the infection.
2. The full involvement of the immune system. The spleen and lymph nodes are producing Killer T-cells and B-cells. Killer T-cells begin to multiply and arrive to fight the invading virus. At the same time B-cells produce antibodies which are effective at targeting a specific invader.
3. Fighting off the virus. By this time the virus is also mounting its own fight for survival. It has entered some of the body cells and is replicating and multiplying on its own. The Killer T-cells are killing the infected cells and the antibodies are working to prevent further growth of the virus.
4. The virus has been contained and the thymus sends out suppressor T-cells to slow down the immune response. At the same time Memory cells are recording specific information about the virus, so that should it appear again, the body will be able to fight it more efficiently and effectively.

The above are the basic mechanics of the immune system. We tend to think of our immune system as fending off invading foreign substances that create an infection - such as bacteria, viruses, parasites, and fungus. However, it is important to understand that other factors have great influence on our immune response. The wholistic approach. These factors include food and nutrition, the environment, and stress.

Understanding Antibodies

As was learned above B-cells make antibodies. With relationship to viruses, there are two types of antibodies to understand. In general, IgM antibodies are formed initially at about the time that symptoms first appear. It will take about 3-5 days for these to show in a blood sample. These antibodies will dissipate after about one month. IgG antibodies are second to appear in the body,

about 1-2 weeks after symptoms appear. They will continue to be present in the bloodstream for a prolonged period of time. The exact amount of time seems to differ according to the type of virus. In simple terms positive IgM indicates a current infection and positive IgG indicates a past infection.

The Wholistic Approach – Other Factors Impacting Your Immune Status

The food we eat is critical. Foods that we are allergic to or that we have sensitivities to will produce an inflammatory response. This activates the immune system, utilizing resources that may otherwise have been required to fight a pathogen. Sugar is known to depress the immune system for up to five hours after being consumed. And, general nutritional deficiencies make it easier for pathogens to invade our body and reduce the effectiveness of the immune system. Our susceptibility to secondary infection is greater and recovery will be slower after infection or illness.

Environmental toxins are known to compromise the immune system, particularly exposure to heavy metals such as: Mercury (found in dental amalgams, vaccines, fish); Lead (found in drinking water, paint, pollution, and pipes); Cadmium (from cigarette smoke, shellfish, and industrial waste); Aluminum (in antacids, vaccines, antiperspirants, pots, foil, and water); and Arsenic (found in rice, tobacco smoke, pesticides, and glues). Again, dealing with environmental toxins distracts the immune system from pathogens. It is quite common to see heavy metal toxicity accompanying pathogen activity.

Signs of a toxic body include fatigue, lethargy, depression, headaches, allergies, muscle aches, chronic infections, frequent colds, sluggishness, nervousness, irritability, sensitivity to perfume and other odors, and joint pains.

Once the body begins to show signs of toxicity, the immune system is over-burdened and autoimmune disorders begin to occur. Did you know the current list of autoimmune diseases is now over 150 and continues to grow? We can truly say there is an autoimmune epidemic underway in the United States. We all know at least one person who suffers from an autoimmune condition. In most cases they are offered little help from traditional medicine. The best case is to “manage” it to keep the symptoms as reduced as possible. There is never any mention of a possible reversal of the condition. Fortunately, many natural/holistic practitioners across the country are having success in preventing and reversing autoimmune conditions every day.

Nutrients for Building a Strong Immune System: Minerals

As a quick refresher, minerals are important to us for several reasons. First, they assist the body in energy production - minerals contain no calories or energy. They work with vitamins and enzymes to fuel all our metabolic processes. We do not make minerals so they must come from the earth and what we eat. Unfortunately, due to soil conditions in much of the country, many of

the minerals have been depleted, so they are not as readily available in the food we eat. These four minerals are critical to support our immune system.

Iron. We're all familiar with how important iron is for the health of our blood. Iron aids in hemoglobin production, which is critical in the transportation of oxygen around the body. Oxygen fuels the body and hemoglobin helps get it around! Iron also supports enzyme formation and function - enzymes too make things happen in the body. The iron containing enzymes are required for energy production and to carry oxygen throughout the body. Iron is also part of the enzyme system that produces DNA - the blueprint of the body - so it is critical in growth, reproduction, healing, and immune function.

Iron is tricky as too little can cause anemia—but too much can lead to atherosclerosis and other cardiovascular problems. Unlike other minerals, excess iron is not excreted from the body. Instead, it's stored in the tissues, accelerating iron overload indefinitely.

Food source of iron include artichokes, beets, broccoli, legumes (garbanzo beans, green beans, kidney beans, lentils, navy beans, and pinto beans), mushrooms, organ meats, parsley, pumpkin seeds, seafood (clams, shrimp), sesame seeds, and wheat germ.

Selenium. Selenium acts as an antioxidant with Vitamin E and aids in DNA and protein synthesis. It is these antioxidants that neutralize free radicals and prevent them from damaging tissues and cells. It supports a healthy immune system response (keeps you healthy), prostaglandin production (these are hormone precursors), and healthy reproductive, pancreatic, and thyroid functions. If you remember some of my previous comments about synthetic versus natural vitamins, you'll find that real Vitamin E complex contains selenium. Guess what doesn't? Yes, synthetic Vitamin E. Perhaps that is why when "they" do the studies that conclude Vitamin E does not support heart health, if we look closer, we learn they are using synthetic and not real Vitamin E. It seems to make a difference!

Selenium is also important in the blood, cardiovascular, endocrine, enzymatic, immune, integumentary, nervous, and renal systems. Essentially it is used throughout the body.

Where to get it? One of the best sources is Brazil nuts. Other sources include barley, broccoli, brown rice, lamb, lean meats, milk, mushrooms, nutritional yeast, organ meats, seafood (cod, crab, halibut, salmon, shrimp, snapper, tuna), tomatoes, turnips, walnuts, wheat germ, and whole grains.

Zinc. Zinc is a very important mineral, especially for men. Zinc is one of the key ingredients for the prostate gland. Men will want to make sure they are getting enough zinc. One in six men will be diagnosed with prostate cancer. Zinc supports the formation of many enzymes and insulin. The same insulin we need for blood sugar control. It also assists with wound healing, reproductive organ growth and development, and metabolism of phosphorus, carbohydrates, and proteins. Putting it simply - zinc helps many bodies processes work and thus is critical to the immune system.

Zinc also has a special relationship with copper - one of antagonism. That means if your zinc levels rise, your copper levels will decrease, or if your copper levels rise, your zinc levels will decrease. This is very significant for women as too much copper can make them "copper crazy". Too much copper throws hormones out of balance and results in many of the "female symptoms". What gets copper levels high? The big three are birth control pills, copper IUDs, and soy (another reason not to like soy).

Zinc is found in many foods including almonds, beets, carrots, cashews, Cheddar cheese, green peas, lamb, lean beef and pork, liver, milk, mushrooms, peanuts, poultry, pumpkin seeds, seafood (crabs, oysters, shrimp), sesame seeds, spinach, wheat germ, whole grains, and yogurt. Lots of healthy food choices to get your zinc!

Calcium. Calcium has many functions. We tend to think mostly of its role in our bone health and in fact 99% of the body's calcium is in the bones. However, that remaining 1% is needed to support the immune system and is found in the body's other tissues.

When Calcium is low in these tissues, it creates an environment that allows viruses to become virulent. Calcium attacks foreign invaders in the tissues in a process called the "calcium wave." Low calcium also triggers high temperature and fevers. As invaders take over the body mobilizes its defenses raising body temperature to help kill them.

Therefore, calcium needs to be able to move in and out of the body's tissues. This is where Vitamin D and Vitamin F get involved which we will learn about shortly.

The best food sources of Calcium are bone meal, cheese (best is Cheddar, mozzarella, and Swiss), collard greens, flaxseed, liver, milk, molasses, mustard greens, sesame seeds, spinach, turnip greens, wheat germ and yogurt.

Nutrients for Building a Strong Immune System: Vitamins

To better understand our immunity let's look at the relationship between four important nutrients – Vitamin C, Vitamin D, Ionized Calcium (Calcium in the blood stream), and the essential fatty acids (from here on referred to as Vitamin F).

Vitamin C is known to support the immune system. Among its many functions is to support the adrenal glands and its hormone production. These hormones are involved in boosting the immune system and rallying it to attack the offender.

Vitamin D has many functions. One of its roles is to move Calcium into the blood stream from the tissues. When there is excess calcium in the tissues it needs to move into the blood stream for circulation in the body.

In addition, it has been found that Vitamin D can protect cells from viruses. There is an enzyme called ACE 2 (Angiotensin converting enzyme 2) that attaches to the outer surface of cells in the lungs, arteries, heart, kidney, and intestines. ACE2 serves as the entry point into cells for some

viruses. Vitamin D blocks or fills the receptor sites of the ACE2 so a virus cannot get into the cell.

Vitamin F (the essential fatty acids) also has many functions. One of these is to move Calcium from the blood stream into the tissues. As we previously learned we need enough calcium in the tissues to fight pathogens.

The best food sources of Vitamin D are: Eggs, fatty fish (mackerel, salmon, sardines, tuna, and trout), liver, and milk products. The best milk product is organic butter.

The best food sources of Vitamin F (the essential fatty acids) are: flax seeds and flax seed oil, lecithin, seafood (halibut, salmon, scallops, shrimp, snapper, and tuna), sesame seeds, sunflower seeds, walnuts, wheat germ, and winter squash.

The best food sources of Vitamin C are: Acerola berries, broccoli, Brussels sprouts, cantaloupe, carrots, cauliflower, kiwi, oranges, papaya, red bell peppers, and strawberries.

Supporting Your Immune System or How to Give Your Body Its Best Shot Against Unwanted Viruses

With all the known and future unknown viruses, we are potentially exposed to the best way to protect ourselves is with a strong immune system. Without that we are prone to these unwanted invaders.

Earlier we learned the importance of Vitamin C, Vitamin D, Ionized Calcium (Calcium in the blood stream), and the essential fatty acids (from here on referred to as Vitamin F) to our immune system.

Let's look at an interesting scenario – the polio outbreaks that used to occur in the summer. The story behind this was that all the kids were together playing. But that doesn't really make sense as kids are together all year round, and you'd think it would be worse cooped up in school. Now let's put all the information from above together.

In the summer, kids are playing outside in the Sun. With the Sun blazing down the body increases the amount of Vitamin D it makes. The Vitamin D moves Calcium from the tissues into the blood stream. One of the first ramifications of this to see is sunburn – tissue damage. If the person stays out too long, it can even evolve into sunstroke. The relationship between Vitamin D and Vitamin F is now out of balance. The low Calcium level in the tissues leaves the person more susceptible to the virus. One of the solutions is to increase the amount of Vitamin F and to make sure you have enough ionized Calcium.

Another virus in the news is the HPV virus. This is the one that has been linked to cervical cancer. As a side note there are some cancer researchers who believe that viruses are at the root of many cancers. Anyways, the incidence of diagnosis of HPV virus peaks at the end of the summer. This provides another connection to the ramifications of increases of Vitamin D without adequate amounts of Vitamin F and Calcium, and likely Vitamin C too.

Appendix

Coronavirus Experts – What They Say and What They Are Doing to Protect Themselves and Their Families

Throughout the current pandemic we have had the opportunity to participate in calls, texts, and webinars with many of the people we consider to be experts in nutrition and our personal mentors. These include Dr. Davis Brockenshire, Dr. Robert Cass, Ann Louise Gittleman, Dr. Michael Gaeta, and the leaders at Biotics and Designs for Health.

Their messages regarding the key nutrients and supplements to optimize and support the immune system particularly with regards to coronavirus are very similar. The specifics differ by the products the various companies provide (Designs for Health, MediHerb, Physica Energetics, Standard Process, and UniKey.) In this Appendix we will review the consensus among the experts and pass along the specifics of the Brockenshire/Cass/Physica protocol.

First, the consensus.

Everyone agrees it is important to support the immune system. The experts believe the need for additional immune system support through supplementation will extend through the pandemic period and beyond.

It has been found that Vitamin D can protect cells from the coronavirus. There is an enzyme called ACE 2 (Angiotensin converting enzyme 2) that attaches to the outer surface of cells in the lungs, arteries, heart, kidney, and intestines. Apparently, ACE2 serves as the entry point into cells for some coronaviruses. Vitamin D blocks or fills the receptor sites of the ACE2 so the coronavirus cannot get into the cell.

The coronavirus attacks the respiratory system – particularly the lungs. If you still smoke, this gives you another reason to stop. Smoking damages the epithelial cells of the lungs, making them more vulnerable to the virus. The condition of the epithelial cells in the young is much better than that of the elder population. This is one of the reasons the coronavirus is not affecting this part of the population.

A second reason is the difference in the amount of melatonin produced by the young and the old. There is a strong link between those who have contracted the coronavirus with multiple pre-existing inflammatory conditions (heart disease, diabetes, etc.). Melatonin helps to regulate NLRP3 inflammasomes which are involved with immune system activation. Melatonin reduces inflammation and is protective for the heart and brain. And for those of you concerned about the coming 5G deployment – melatonin is reduced by 5G.

And, a third reason for the difference between the young and the old is the thymus gland. This gland is at the center of our immune system and is significantly more active in children than older adults.

Vitamin C, Selenium, Zinc, and the herbs Andrographis and Echinacea also appear on everyone's lists as key supplements to support the immune system. Andrographis has anti-furin properties. Furin is a substance that will worsen the virus. There have been some reports that the

herbs produce what is called a cytokine storm which can worsen the condition of someone with coronavirus. This is not the case and these herbs have been found to be safe.

Now, more specifics from Drs. Brockenshire and Cass.

Here are some highlights from a webinar delivered by Drs. Brockenshire and Cass:

- Do all you can to reduce stress. Vitamin B Complex from Physica is recommended. If there is deeper emotional distress and hormonal imbalances there are other supplements to consider. Buffered Magnesium with Taurine can also help with stress.
- Sleep is very important. While we sleep our body regenerates damaged cells and supports the immune system. (The one benefit of all this craziness is that we have been getting a bit more sleep than prior – not rushing off to the office in the morning!)
- Now is not a good time for a cleanse. It is more important to rest the body than stress it with a cleanse.
- Reduce brain inflammation with Turmeric, ASURA, and Ginkgo.
- There are several botanicals for prevention and recovery in the Physica and MediHerb lines he recommends. Here, the focus is on Thymus and Spleen support.
- Be aware in addition to the threat of coronavirus, there is still lots of Flu A and B out in the public.

Here is Dr. Cass's immune system protocol:

For adults: Start with 1-2 scoops of Camu Camu Vitamin C in water. Add to it 3 droppers of Olive Leaf Intrinsic, 3 droppers of Sambucus Intrinsic, 3 droppers of Myrrh Intrinsic, and 15 drops of Flu Milieu. Stir it up and drink. In addition, do 20 sprays of Solray-D and 3 capsules of Spleen LF. This is done twice per day. Also, do one full dropper of Sambucus before bed. (Please note: Dr. Brockenshire suggests 10 sprays of Solray-D per day. We think 10 sprays is sufficient unless you are in the high-risk category)

For kids: 1-2 droppers per day of Echina Intrinsic and 1 dropper of Mycelia Intrinsic in pear or grape juice.

If you have any questions, please let us know.

Disclaimer

This eBook is designed to educate people about diet, a lifestyle approach to health and well-being, natural remedies, options, and dietary supplements. None of this should be construed as a substitute for medical attention. Rather, individuals with specific medical concerns or symptoms should seek advice from a physician.

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