Immune Resilience

Helping Your Body Respond Better

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In our current circumstances, with the entire world fighting to stay healthy, it is more important than ever to do what you can to improve your immune system function. This involves two aspects: your immune tolerance, and your immune resilience. Refer to the boxes for definitions and explanation. Topics are well researched and known to increase your Immune Resilience.

SLEEP: Of all the different mechanisms in the published literature related to supporting immune function, nothing comes close to getting adequate sleep. Parts of the immune system like natural killer cells and T cells, which we use to fight infections, are enhanced and activated when you're asleep. Your body needs sleep and your immune cells need sleep to function properly. Lack of sleep increases the risk of infectious illness, and also can increase inflammation in the body. Routinely getting less than six hours of sleep per night has a profound negative impact on the immune system. If you get less, it's critical to take a nap midday, as even little as 20 minutes can help. Losing one night's sleep can impact your immune system and make you vulnerable for infection the next day. There are

IMMUNE TOLERANCE is a concept in immunology in which your immune system appropriately reacts to the environment. With proper immune tolerance, you don't have a high degree of food sensitivities, you don't react to chemicals and you don't have autoimmune disease.

As you lose your immune tolerance you react to food proteins and develop lots of different food sensitivities and reactions. Another type is called chemical tolerance. If you have lost your chemical tolerance, you may notice that your skin reacts to different lotions, detergents and soaps that you use. Or you may not tolerate some chemical scents in your environment, like perfumes or dry-cleaning chemicals. This can really make you feel sick or have different kinds of symptoms, like headache.

The third type is self-tolerance. Losing self-tolerance means de-veloping an autoimmune disease, in which your body starts to attack itself. Examples are rheumatoid arthritis, where your immune system attacks your joints, or Hashimoto's thyroiditis, where the immune system attacks the thyroid.

many aspects of sleep hygiene to consider, beyond the scope of this article. If you don't sleep well, try to find out why, and address what you can to correct it.

SUNSHINE, AND VITAMIN D: Another excellent way to support your immune system is to get sun on your body. Most people know that sun exposure produces Vitamin D under the skin, but it does much more than that. Sun improves your mood, affects serotonin levels (the feel-good hormone), balances hormone production and circadian rhythm (which can help your sleep!) Scientists estimate that you can produce as much as 15,000 to 30,000 IU of Vit. D in your skin from only 20-30 minutes in the midday sun with large portions of your skin exposed. (But, of course, don't get burned.) If you can't get outdoors, you can take Vit. D3 supplementation, and it's best paired with Vit. K2.

HYDRATION: Water is important for many immunological biochemical steps that are necessary to allow your immune system work.

IMMUNE RESILIENCE is your body's ability to deal with any kind of pathogen. We all get exposed to bacteria or viruses in our everyday life. Our ability to prevent that pathogen from infecting us and causing us to have a significant ongoing immune response really depends upon our immune resilience. For a person who has lost his immune tolerance, there will be some impairment in their immune resilience. A person who has developed food sensitivities, reacts to lots of chemicals, or already has an autoimmune disease, has an immune system already compromised in such a way that the immune cells that fight off infections are not as efficient.

One way to improve your Immune Resilience is to improve your Immune Tolerance. If you continually expose yourself to things you react to, like foods (wheat, gluten, dairy, eggs are most common) or chemicals, it just weakens your immune system. Another strategy is to increase your microbiome diversity, by eating a large variety of plant foods (vegetables and fruits) to provide the plant fibers that feed your gut bacteria. As you become less reactive to foods, chemicals, and environmental triggers, you actually have a chance for the immune system to get healthy and then have some degree of a strong defense against pathogenic viruses and bacteria that we are exposed to. A strong Immune Resilience gives you a fighting chance!

Water carries oxygen and hydrogen, and water is responsible for many biochemical and immunological reactions that are necessary for you to have a healthy immune response. Water is essential for you to have some degree of osmotic pressure and fluid in your blood to allow you to have proper exchange of immune cells through circulation. Water has a big role in the electrolyte and sodium balance in your body. When you get dehydrated and don't have enough fluid to change the viscosity and the osmotic pressure for immune function than any supplement you take. Most people need around 64 ounces of water daily, but needs can vary based on many factors. Don't wait until you feel thirsty; drink small amounts all day long during waking hours, unless you have a medical reason to limit your fluids.

AVOID SUGAR: Research has shown that sugar wipes out T-cells and natural killer cells in the immune system. The sugar from something very sweet can suppress these immune cell functions for six to eight to 12 hours from one exposure. Eliminate processed sugar and concentrated sugars from your diet. Eliminate foods like fruit juices, sodas, candy bars, any form of sweets or desserts if you are concerned about your immune system. (Fruit is not as concerning in its natural state, as it contains dietary fiber.)

INCREASE THE DIVERSITY OF BACTERIA IN YOUR GUT: These beneficial bacteria, called your microbiome, make up about 70-80% of your immune system! Having a very diverse microbiome is critical. The bacteria in your gut are produced by eating high fiber foods (plants) that are prebiotics, basically providing "food" for the bacteria.

A **probiotic** is a particular strain of bacteria that you might take as a dietary supplement, to provide some immune-enhancing effect for some people, certain gene types, (some better than others), based on their overall microbiome health. Finally, a **postbiotic** is what the bacteria makes itself. A lot of research is focused is now on postbiotics. Your bacteria produce polysaccharides, and a specific type, polysaccharide A, has been shown in animal studies to calm down autoimmunity. Eating a diet high in vegetable fibers and in great variety will increase the diversity of the bacteria in your gut…and help your immune system. Studies have shown that just one day, and especially three days, of a high and diverse fiber diet can change your gut microbiome. One of the best things you can do is to diversify your diet with lots of different vegetables and fruits. It is fine to blend them to drink also, or make into soups or stews.

TWEAK YOUR DIET, UP YOUR ANTIOXIDANTS AND FIBER:
Flavonoid antioxidants improve your immune function overall, and you get these from fruits and vegetables with lots of different colors. Yet another reason to up your vegetable and fruit intake! Super foods like acai, and blueberry, raspberry, any food rich in flavonoids really have a big impact on supporting your antioxidant status. Eating fresh garlic, crushed, or gently cooked is anti-viral and anti-bacterial.

Reduce your inflammatory food intake, because these foods contain substances that eat up your antioxidant reserves. What are they? Any fried food is very inflammatory. Any food that contains partially hydrogenated fats, which are foods that come in bags or boxes, are inflammatory. Highly processed foods are highly inflammatory. Eating foods in their natural state is always a safer bet!

Eat a High Fiber Diet: We already addressed above the value of fiber in creating diversity in your gut microbiome. But fiber does even more! When you ingest fiber, both soluble and insoluble fiber, your gut produces short chain fatty acids: butyrate, acetate, propionate. These short chain fatty acids immediately turn on cells in the gut called T-reg cells. These T-reg cells in the gut then send messenger proteins out to the rest of the immune system (even more efficient when you get physical exercise and get your heart rate up). Then these T-reg cells starts modulating your immune system, and they make your immune system very, very efficient to coordinate an immune response, to either fight an infection or to keep your immune system healthy. A high fiber diet (plant foods) makes a big impact on raising butryate levels (short chain fatty acids in your system).

Be very conscious of your reactions to food proteins: You may already know you are sensitive to certain foods, as you experience an adverse reaction when you eat these foods, or just feel generally unwell after eating them. Other people may be unaware that they have food sensitivities, just haven't put "two and two together yet". Addressing this topic is beyond the scope of this article, but be aware that eating foods that you are sensitive to is an assault on your immune system every time you eat the offending food. These are the most common reactive foods:

- Casein protein in milk is one of the most reactive.
- Gluten in grains is very, very reactive.
- Egg albumin (the white part) is very reactive.
- Corn proteins are very reactive for many, many people.

MANAGE YOUR STRESS

There is so much than can be said on this topic, these tips just skim the surface. It is well known through research that high stress levels depress the immune system. So here are a few ideas:

Stay away from too much news, especially media filled with negative reports. This is depressing and not good for your immune system. There is much misinformation on the internet and on so

Online Resources Specific to Covid-19

If you have access and use the internet, these are some good resources that address in much greater detail the role of nutrients and botanicals in both prevention and treatment of illness, and specifically coronavirus. It is interesting to note that several items are found to be useful for prevention, but once you have the virus, it is recommended to stop using them. (Nothing's ever easy!)

University of Arizona Andrew Weill Center for Integrative Medicine. https://awcim.arizona.edu/COVID19/FAQ.html

If you prefer to watch a video, this is a link to the webinar from the same source, AWCIM, called **An Integrative Approach to Covid-19.**

https://www.youtube.com/watch?v=CihraO8cvGg&feature=youtu.be

cial media; don't buy into it. If you are looking for the most reliable source of information related to the coronavirus, go to the CDC or World Health Organization websites for the most accurate, up to date information. They do not put a spin on things for sake of ratings!

Another key thing that has a huge impact on immune function is your general opioid status throughout the day. Your body makes opioids throughout the day. Whether it's a positive emotional response, a healthy relationship with family members, whether it's just a hug, or watching a movie that makes you feel good, opioids have a profound impact on our immune system. Exercise has a large impact on our opioid system. Our immune cells like T regulatory cells and T-cells all have receptor sites for opioids. So how do you increase your opioid levels?

One thing few people consider in supporting immune resilience is the role of laughing and crying. Both have profound physiological effects on the human body and a direct impact on the immune system. When you laugh, you actually create a very powerful opioid response that has a powerful immune modulating effect. Crying is also helpful. Crying is a reflexive physiological response to help you release opioids that then modulate your immune system and block inflammation and help you deal with the physiological stressor. If you can laugh about something that's so funny that it makes you cry, even better.

Laugh more! Laughing supports your immune function because it triggers the release of opioids, which is why laughing feels so good.

In addition to making you feel better, opioids also exert a powerful influence on activating and modulating immune cells such as T-cells, natural killer cells, and regulatory T-cells. This makes your immune system more effective in dealing with pathogens such as viruses. In fact, laughing can have a more profound impact on your immune system than any supplement. Watch funny movies, YouTube clips and such, anything funny to laugh as much as you can.

Since crying also releases opioids, it is also an important but commonly overlooked way to support immune resilience. It's common for people to cry in response to a crisis situation. Researchers believe this is a built-in function to release opioids and hence better protect the body while dealing with a significant stressor. Take stock of issues in your life that are troubling you. By delving in and having a good cry, you can actually support immune function through the opioid release that comes along with releasing your tears. (Note: Please do not get in over your head with overwhelming emotional processes. Seek support to help you in this process if you need it.) When it comes to supporting overall immune surveillance and resilience, make sure you are laughing regularly, but also cry and release painful emotions as needed.

Finally, keeping your immune system healthy really has a lot to do with your state of mind. There's a field of immunology called the psychoneuroimmunology. It has its own field of study, and has its own research journals. From this study, they have found there's no question that your thought process, your mood and your emotions have a significant impact on your immune status. It's dynamic, changing from day to day. Really try to stay positive, look for the good, and avoid the negative. It pays for your immune system!

MOVEMENT: JUST MOVE MORE!

How your immune system works related to movement is very important to understand. Our immune system has different immune surveillants throughout our system. These are macrophages or antigen presenting cells. When the virus or bacteria comes into your body, these macrophages sense a pathogen and engulf it. They send for "help" through different messenger pathways, or cytokines. These messenger systems then are sent into your circulation, and then into your lymphatic system where your lymph nodes containing those immune cells are waiting to figure out what to do.

But remember: hard exercise produces free radicals. You've got to figure out what your personal tolerance is to exercise. If you have a very severe autoimmune disease, you may not be able to handle much exercise. If you are fighting an infection, you've got to be careful how much exercise you can do because it also increases your free radicals. You need to find the balance, but you need to do what you can.

Do you have difficulty getting exercise?

It is true that many have physical limitations which limit the amount of movement, or exercise, that one can accomplish. But nearly everyone can "do more" than they currently do.

Stretching, chair exercises, and even isometric exercise (tensing a muscle intentionally, holding it, then release) can increase lymphatic flow quite significantly. But the more you can do, the better, so make it a goal to improve on your current level, since it provides many benefits, but most important here, a chance to improve your immune resilience!

When healthy:

- Get your heart rate up for at least 10 minutes a day, more is better
- A brisk walk for a couple of minutes can improve your lymphatic flow

With an Infection or you're ill:

- Don't overdo, just move and use motion to stimulate your immune system
- A slow walk around the room is good

Without proper movement and motion, you can't get proper lymph activity and therefore get the immune messengers responding to infection throughout your immune system very well. When you move and contract your muscles, you're actually pumping out your lymphatics. When you move (or exercise), you also increase your heart rate, so you improve your circulation and blood flow. From an immune perspective, when you have movement and motion, muscle contractions and increase your heart rate (which improves your blood flow and circulation), this is all a positive impact. The immune messengers that the immune system needs to integrate and communicate the proper immune response becomes more efficient.

NUTRIENTS

Some people think that when it comes to supporting your immune system, you need to take dietary supplements in the form of nutrients or botanicals. While there is evidence for some agents, these are far less important to your immune resilience than all the other items mentioned in this article. That said, here are the nutrients and botanicals that are likely most effective while also safe for nearly all people. (If you have chronic health conditions, take a lot of medications, have autoimmune conditions, or are already immune-compromised, please seek medical advice before starting any supplement plan or altering a prescribed dietary plan.)

Vitamin C has been shown time and time again to be very effective in improving natural killer cell activity, and there is solid research behind this. It inhibits inflammatory reactions, and shortens the frequency, duration and severity of the virus that causes the common cold (a type of coronavirus), and reduces the incidence of pneumonia. It is a water-soluble vitamin, and excesses that are not absorbed into the tissues are excreted in the urine. Mineral ascorbates, ascorbic acid, and even liposomal vitamin C are all effective. What you choose may depend on preference, cost, availability, and dosage is often 1000 mg. daily, or more. High dose Vitamin C is now being studied in both prevention and treatment of viruses and pneumonia (especially delivered by IV) but results are not yet in.

Vitamin A has solid research related to its role in immune health. It is a nutrient involved in gene expression. Vit. A is best known for its vital role in promoting vision, but most of this nutrient is not found in the eyes, but in the blood stream and tissues. It is essential for healthy skin, and the inside surfaces of the mucous membranes—the linings of the mouth, lungs, stomach, intestines, and urinary tract. Vit. A is a fat-soluble nutrient, so it requires fat to deliver it to the tissues. What is not needed is stored in the liver and fat tissue.

Vit. A from animal sources is in the form of retinol, which is metabolized in the intestines. Vitamin A from plant sources are called Provitamin A carotenoids. The most common is beta-carotene, which is responsible for those rich colored pigments in vegetables and fruits. You cannot overdose on Vit. A from plant sources, because when the body gets more than it needs, it slows down the conversion of the vitamin. Deficiency of Vitamin A impairs innate immunity, induces inflammation, makes existing inflammatory conditions worse, and impairs the ability to defend against pathogens like viruses and bacteria. Vitamin A supplementation is of benefit in reducing the morbidity and mortality from infectious diseases (especially in children).

NUTRIENTS FROM FOODS

High **Vitamin C** foods: Citrus fruits, broccoli, cauliflower, green (and other color) peppers, strawberries

Vitamin A (retinol) animal sources: Liver, fish liver oils, dairy milk & milk products, butter, eggs

Vitamin A (carotenoids) plant sources found in yellow/orange/red color vegetables: Carrots, sweet potatoes, pumpkin, winter squash, apricots, cantaloupe, papayas, peaches

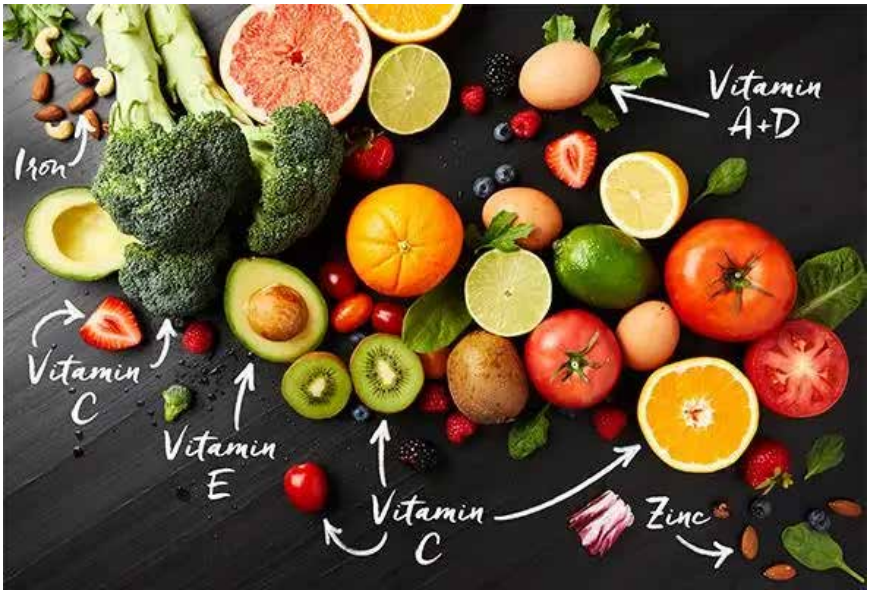
Vitamin A is also found in vegetables where the dark green pigment masks the color orange! Broccoli, swiss chard, kale, spinach, romaine lettuce, endive

Vitamin D Food Sources: Egg yolks, Butter, Liver, In the US, most get Vit. D from fortified dairy milk and other fortified foods

Zinc Food Sources: Seafood, meats, whole grains, legumes

Vitamin D is the third nutrient with significant positive research showing its benefit for the immune system. Vit. D is a potent immune system modulator when metabolized to its active form, 1,25-dihydroxycholecalciferol, which is what is formed in the skin exposed to sunshine. Given adequate sun exposure, you don't even have to consume any Vit. D in the diet! That is a positive, because there are not many good food sources of Vit. D. It is unfortunate but true that many people are Vit. D deficient, so it is wise to have Vit. D levels tested when you get lab work done. Deficiency is easily treated with supplementation. Because Vit. D deficiency correlates with higher susceptibility to infections, it is clear that this nutrient has a key role in immune function.

Zinc is a mineral that influences both innate and acquired immunity. Zinc helps to maintain skin and mucosal integrity. Deficiency leads to decreased function of immune cells, like helper T-cell and Natural Killer cells. Zinc has prover powerful in fighting off regular influenza and the common cold when used as a dietary supplement. Don't use high doses long-term, as it will upset the zinc/copper balance in the body. Usually doses of 15-30 mg. per day are used as a supplement.



BOTANICALS

Echinacea: A literature search on botanicals reveals the strongest evidence for upper respiratory infection and protection for immunity is echinacea. Echinacea has several thousand studies and multiple clinical trials and meta-analysis studies. (Meta-analysis studies combine the data from many clinical trials to see if all these clinical trials come up with a strong conclusion.) In studying echinacea the conclusion from meta-analyses has been actually positive that there is some protective effect.

Quercetin: Quercetin is a potent anti-inflammatory and antiviral substance found in certain foods. Many people may be familiar with using Quercetin as a dietary supplement in the fall and spring to help with allergies to tree and weed pollen. But recent research has been focused on its broad anti-viral properties. Quercetin is considered a bioflavonoid. It appears to inhibit viral replication, and protects the lungs and other vital organs from virus- and cytokine-induced oxidative stress by supplying and maintaining sufficient levels of antioxidants. It appears to help strengthen the immune system and reduce inflammation without overstimulating the immune system. Quercetin can be found in foods, including red

PLANT POWER

Echinacea is a little plant with big healing power. Its name comes from the Greek word for hedgehog (echinos) because its prickly seed head resembles the spines of angry hedgehog. Native Americans have used echinacea for more than 400 years to treat infections and wounds. Before the introduction of antibiotics, it was used for scarlet fever, syphilis, malaria, blood poisoning, and diphtheria.

Herbalists recommend echinacea to shorten the duration of the common cold and flu, and reduce sore throat, cough, and fever. Science backs up the power of echinacea to treat upper respiratory tract infections and much more.

It is taken as a tincture, a tea, or capsule. It can also be used topically, for stings and bites. It is extremely popular in Europe, and especially in Germany. Use in the US is primarily by Integrative Medicine followers. Research shows that echinacea is both antiviral and antibacterial.

onions, berries, red wine, green tea, buckwheat and apples. It is available as a dietary supplement. There is now a clinical trial being conducted in China for its effectiveness against covid19, but of course it will be some time before any results are concluded.

CAUTION WITH AUTOIMMUNE CONDITIONS

If you do have autoimmune disease, you've got to be very, very careful with things like botanicals that stimulate the immune system because it can also trigger an autoimmune response. Not all people will react the same, so it is important to proceed with caution, especially with botanicals or mushrooms. Examples of autoimmune disease include Hashimoto's hypothyroidism, rheumatoid arthritis, type 1 diabetes, multiple sclerosis, psoriasis, Crohn's disease, ulcerative colitis, alopecia, vitiligo, and so on.

NOTES

KITCHEN ANGELS is dedicated to providing free, nutritious meals to our homebound neighbors facing life-challenging conditions.

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