**HOW TO BOOST YOUR IMMUNE SYSTEM**

**The Immune System** is a functional system rather than an organ system in an anatomical sense.

1. Main Parts of Our Immune System

* Lymphatic System:

1. Lymphatic vessels – It’s an elaborate drainage system for the fluid left behind in the tissue spaces, as much as 3 L daily.
2. Lymphoid tissue, like lymph nodes and organs, such as tonsils, appendix, thymus, spleen

* Body Defense System:

1. Innate or non-specific defense mechanism – our inherited system: First line of defense (skin, mucus membranes, secretion of ski and mucus membranes) and second line of defense (fever, inflammatory response, phagocytes, natural killer cells)
2. Adaptive or specific defense mechanism – learned/acquired system: lymphocytes, antibodies, macrophages and other antigen-presenting cells
3. Signs and Symptoms of an Impaired Immune System

* Reoccurring, frequent and/or long lasting infections
* Slow wound healing
* Inflammatory disorders, like eczema
* Allergies
* Autoimmune disease
* Fatigue, including fibromyalgia
* Dysbiosis, which is an imbalance of the gut flora
* Herpes outbreaks

1. Immune System Stressors

* Lack of sleep – most common cause, weakens the body’s ability to protect an heal itself
* Lack of protein in the diet (either due to poor diet or poor absorption) – protein is a building block of our immune cells
* Lack of beneficial bacteria in the gut – it enormously hampers the ability of the immune system to function properly
* Stress (physical, mental and psychological) – causes the release of excess cortisol, our stress hormone, which is immunosuppressive
* Environmental and food pollutants, toxins – greatly strain the body’s detoxification systems
* Lack of exercise or movement – impairs lymphatic drainage
* Chronic persistent infections, like Epstein-Barr virus, candida – uses up the resources of the immune system, which reduces its availability for other threats and can cause long term impairment
* Too much sugar, alcohol, caffeine
* Food sensitivities and food allergies

**10 Most Important Dietary Factors**

* Chemical Free Wholesome Diet

What is a whole food? Any food that you can pick or hunt is going to promote health, while foods which are altered or processed, will not. Foods grown through organic farming practices and animals raised free range are found to have the most nutrient content.

The goal is to obtain our nutrients from our foods, which can be a challenge these days because the soil is depleted in minerals and our food is sprayed with chemicals. Our animals are raised in crowded and un-humane conditions and treated with medications.

In order to stay ahead of the game of health and nutrition it is imperative to find our local and trustworthy sources of clean, fresh and wholesome foods and to prepare our own meals ourselves!

Each year the Environmental Working Group releases its annual “Dirty Dozen List”, which is a list of foods you should always, whenever possible, buy organic. The group analyzes Department of Agriculture data about pesticide residue and ranks foods based on how much or how little pesticide residue they have. The group has estimated that individuals can reduce their exposure by 80% if they switch to organic when buying those 12 foods.

I included a link to their website for a printable list in your outline.

<https://www.ewg.org/release/2017-dirty-dozen-strawberries-spinach-top-ewgs-list-pesticides-produce#.WmNyKzdrz4Y>

* Filtered/Purified Water

Water is second in importance to air. Water is fundamental to life and it is the universal solvent. Our bodies are approx. 60% of water depending on our age. Water is a component of all of the body fluids and is essential in the transportation of nutrients and the removal of toxins. If the water we drink is full of chemicals it negatively affects our health. Earth’s water is in a crisis. It’s drying up, getting diverted and it is becoming toxic. Drinking water has become an issue of concern. Tap water is not safe anymore as it is possibly contaminated. The best sources of clean water are spring water, mineral water or filtered water. How much water do we need? It is recommended to drink 6-8 cups of water every day. This amount varies based on our activity level, our age and size. The best way to do this is to follow the following schedule:

* 1 cup upon rising
* 1 cup at breakfast time
* 1 cup mid-morning
* 1 cup at lunch time
* 1 cup mid-afternoon
* 1 cup during cooking
* 1 cup at dinner time
* 1 cup before bed
* Avoid Sugar

Sugar decreases the function of the immune system almost immediately. There is an intimate relationship between glucose and vitamin C that has a dramatic impact on immunity and overall cellular health. Both glucose and vitamin C use the same cell receptors. Both glucose and vitamin C depend upon the pancreatic hormone insulin and its signaling effects in order to get into cells. This means that elevated glucose levels compete and effectively restrict vitamin C from entering the cells.

It’s important to avoid sugar, especially added and refined sugar, when you feel like you are coming down with a cold. However keeping sugar, particularly refined sugar out of your diet on a long term is very beneficial in order to avoid any degenerative chronic illnesses. Keep in mind that there are naturally occurring sugars for example in fruits and fruit juices and added sugars in processed foods like ketchup. What counts is the total sugar intake.

* Eat Garlic Regularly

Fresh garlic has antiviral, antibacterial and antifungal properties. Garlic is one food everyone should eat every day. It is important to remember, that only fresh garlic has these properties. Within an hour of smashing the garlic it loses its infection fighting power. Therefor garlic supplements are not as useful. The best way to take garlic is to smashing it prior to consuming or putting it through your juicer. If you swallow it intact your body cannot convert *allicin* to its active form.

* Consume Probiotic and Prebiotic Rich Foods

What is a probiotic? 80% of your immune system is located in your gut, accordingly probiotics are key in achieving better health and strong immune system. Most if not all illnesses originate from the gut. Therefor probiotics play an essential part in establishing and maintaining our health. Probiotics are bacteria that line the digestive tract and support the body’s ability to absorb nutrients and fight infection. The benefits of probiotics have been proven effective in supporting immune function and healthy digestion, as well as beautiful skin. Other functions of probiotics:

* Produce vitamin B12 and K2
* Crowd out by destroying bad bacteria, yeast and fungi
* Stimulate the secretion of IgA antibodies and regulatory T-Cells

Historically, we had plenty of probiotics in our diets from eating fresh foods from good soil and by fermenting our foods to keep them from spoiling. However, because of refrigeration and dangerous agricultural practices like soaking our foods with chlorine, our food contains little to no probiotics today, and most foods actually contain dangerous antibiotics that kill off the good bacteria in our bodies. In addition to this we destroy the remaining good bacteria by taking prescription antibiotics.

*Examples of probiotic containing foods:* fermented vegetables; raw/unpasteurized apple cider vinegar (with the mother); high quality organic kefir and probiotic rich yoghurts; kimchi (Korean sauerkraut); natto (fermented soy); kvass (fermented rye or barley) etc. Eat at least 1 serving of these foods a day.

*What are prebiotics?* Prebiotics are food for the good bacteria in the gut. They feed and boost the probiotics in the gut. They are high quality soluble fiber which are also fermentable fiber.

*Examples of prebiotic* containing foods: chia seeds; flax seeds; sweet potatoes; raw Jerusalem artichokes; raw or cooked garlic and onions; raw dandelion greens; under ripped bananas; etc.

It is easy to incorporate these foods into your diet every day. For examples you can add chia and flax seeds to your morning smoothie to make it easier to consume it every day.

* Incorporate Foods Rich in Vitamin C

Vitamin C is one of the most well-known immune-booster. It is also anti-inflammatory, antioxidant and antihistamine. Vitamin C is an essential micronutrient and also one of the most difficult ones to get because it is very unstable and easily oxidized. It is a water soluble vitamin, which means if it is in excess, our body can easily flush it out through the bowels and kidneys. Most animals and plants are able to synthetize vitamin C from glucose except for primates, Guinea pigs, a type of fruit bat and humans. Humans must consume vitamin C from its food sources or it risks severe health problems. When vitamin C levels are low the body is able to recycle the oxidized vitamin C with the help of our master antioxidant, called glutathione. Quercetin, a bioflavonoid found in citrus fruits, is also found to have immune boosting, anti-inflammatory and antihistamine effects.

*Some other Functions of Vitamin C:*

* Collagen production
* Iron absorption – If you are iron deficient and you would like to boost your iron stores with non-heme iron (vegetable source), then you must make sure you consume vitamin C rich foods with it to ensure proper absorption, One example would be a spinach salad w/fresh lemon dressing on it.
* Serotonin hormone production
* Prevention of gall stones

*Food sources of vitamin C:* papaya, bell peppers, broccoli, Brussel sprouts, strawberries, kiwi, citrus fruits, etc. Remember that vit. C gets destroyed when heated therefore only fresh raw sources contain this important vitamin!

* Add more Vitamin D Rich Foods

Vitamin D is a fat soluble vitamin, which means our body stores it. It’s actually not a vitamin. It’s a hormone. Vitamin D is not just important for your bone and teeth health as it assists in the absorption of calcium. It is essential for your immune system among other body functions. T and B cells have vitamin D receptors therefor Vitamin D can modulate the innate and adaptive immune responses.

*Examples of vitamin D deficiency conditions:* asthma; hay fever; anxiety; depression; hypertension; IBS; high cholesterol; inflammation; and many more.

Vitamin D experts agree that deficiency is an epidemic now especially in North America. Vitamin D levels can be assessed through a blood test using a 25(OH)D test, also called 25-hydroxyvitamin D. I believe unfortunately this test is not paid by Alberta Health Care anymore. In order to establish a base line, in my opinion, everyone should be tested. Optimal levels are between 50-70 ng/L.

*Examples of vitamin D rich foods:* Sea fish (mackerel, salmon, tuna); vitamin D fortified foods (dairy, cereals, fruit juices); trout; halibut; egg yolk; beef liver; etc.

* Adequate Protein and Iron Intake

The body uses amino acids found in dietary proteins to help build proteins within the body including proteins that help make up our immune system. For example, immunoglobulins - also called antibodies - are proteins that circulate in your blood and make up key components of a strong immune system. Proteins are also part of interferon and complement proteins that support immune system cells or attack viruses, bacteria or other foreign substances in your body.

The recommended daily allowance (RDA) for protein is 0.8 g per kilogram of body weight. So an adult male who weighs about 70 kg requires 56 g of protein and an average woman who weighs 50 kg needs 40 g a day. The RDA increase by 25 g during pregnancy and lactation. During growth, different amounts are needed.

Protein sources can be animal or plant based. Animal based sources are complete proteins, which means animal proteins contain all essential amino acids, while plant sources don’t all do. Examples of complete plant based protein sources are: rice + beans (2:1); chia seeds; soy.

* Omega 3 Essential Fatty Acid Rich Foods

Omega 3 essential fatty acids have an important role in the inflammatory regulation of the body through the production of prostaglandin 1, a substance, which has anti-inflammatory properties. Omega 3s also increase the activation and number of T-cells within the body, and therefore the ability to fight disease.

* Incorporate Zinc and Selenium Rich Foods

If your body has inadequate zinc stores, you will experience increased susceptibility to a variety of infections. White blood cells simply can't function without zinc. Zinc affects multiple aspects of your immune system, including neutrophils, natural killer cells, phagocytosis, antibody production, and even gene regulation within your lymphocytes. Zinc is involved in many basic cellular functions including DNA replication, RNA transcription, cell division and activation, and stabilization of cell membranes.

Selenium is an important antioxidant and immune booster. One of the most important functions of selenium is its ability to help your body fight disease. It raises your white blood cell count so you're more able to resist infections.

**Herbs And Spices**

Turmeric - This spice contains curcumin, which has notable antioxidant properties. It also has antibacterial, anti-inflammatory and stomach soothing benefits. It reduces inflammation by stimulating the adrenal glands to increase the hormone that lessens inflammation.

Ginger - This herb has been shown to reduce inflammation, cardiovascular conditions, blood clots and cholesterol.

Echinacea Tea- This herb has been shown to boost immunity.

**Rest**

In my opinion people grossly underestimate the power of rest and sleep. It seems to me that with the ever growing expectations on us to be the perfect parents, siblings, children and spouses/partners and with only 24 hours a day available to us, we tend to chip away at our own rest and sleep to complete all the tasks. Then we walk around exhausted high on coffee. I have been there and done it. Believe me, I had to fall on my face a few times to learn to say “No”. As my good friend and Life Coach, Kyla Berg once said “No is a complete sentence.”

At this point in our busy lives we must schedule everything into our calendar in order to not miss it, maybe that’s what we should do with sleep and rest, too.

*Effects of Lack of Sleep and Rest:*

* Impaired Immune System
* Metabolic Syndrome (Syndrome X)
* Cardiovascular Disease, Atherosclerosis
* Hormonal Imbalances
* Depression and Mood Disorders
* Risk of other Degenerative and Chronic Illnesses

Both the quantity and quality of sleep is extremely important. We should all aim for a minimum of Eight hours of sleep in a regular schedule with not going to sleep later than 10 pm. To make it easier to develop a healthy sleep habit, especially when we are transitioning from a crazy lack of sleep lifestyle, is to establish a healthy bed time routine. Make a list of the things, which relax and balance you, whether it is a hot bath/shower, a good book or a cup of your favorite hot tea. Make it simple yet special!

**Sunshine And Fresh Air**

Without sunshine nothing can exist on Earth, including us. With all the advice to stay out of the sun and to lather up with SPF has not brought down the cancer rate. If anything there is an increase in all cancers. So why is that? We know that vitamin D is essential for our immune system and we must have a strong and healthy immune system in order to avoid cancers and other infections. My advice on this subject is to spend as much time possible in the sun exposing larger areas of our bodies, at least in the summer months. The best time for “sunbathing” is the early morning and late afternoon hours in order to avoid skin burns, as burning our skin does accelerate aging by damaging the skin and makes us prone to skin cancer.

Walking outside in the fresh air gives us a chance to collect our thoughts and to distress, which is important for our health, including our immune system. Breathing the fresh air in deep flushes our lungs from toxins and pathogens and the surge of oxygen filled blood nourishes all of the cells. Increased oxygen translates to grater energy and clarity of the mind. Spending at least 15-20 minutes outside in the fresh air every day contributes to improved sleep as well.

**Exercise**

Regular exercise is an essential part of the healthy immune system. Both weight bearing and resistance training helps to improve immune function. During exercise our heart rate and blood flow increases, which helps in the transportation of nutrients and in the removal of toxins. Muscles burn more calories, which means we will have a better outcome if we want to lose weight, provided our diet supports this goal. Also when we exercise our lymph, which is an important part of the humoral part of the system flows more effectively. Strenuous exercise however has immune suppressive effects.

**Supplements To Consider**

Vitamin C – If tolerated 4-10 gr of vitamin C per day is recommended. If a whole vitamin C complex supplement is taken as well, the daily amount of ascorbic acid can be lower. During times of sickness the amount can be in the higher range.

Vitamin D – Depending on the vitamin D levels in the body here is a guide line for the daily recommended amounts based on Health Canada recommendations.

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| --- | --- | --- |
| **Age group** | **Recommended Dietary Allowance (RDA) per day** | **Tolerable Upper Intake Level (UL) per day** |
| Infants 0-6 months | 400 IU  (10 mcg)https://www.canada.ca/content/dam/hc-sc/migration/hc-sc/images/fn-an/symbol_asterisk.gif | 1000 IU (25 mcg) |
| Infants 7-12 months | 400 IU  (10 mcg) https://www.canada.ca/content/dam/hc-sc/migration/hc-sc/images/fn-an/symbol_asterisk.gif | 1500 IU (38 mcg) |
| Children 1-3 years | 600 IU (15 mcg) | 2500 IU (63 mcg) |
| Children 4-8 years | 600 IU (15 mcg) | 3000 IU (75 mcg) |
| Children and Adults 9-70 years | 600 IU (15 mcg) | 4000 IU (100 mcg) |
| Adults > 70 years | 800 IU (20 mcg) | 4000 IU (100 mcg) |
| Pregnancy & Lactation | 600 IU (15 mcg) | 4000 IU (100 mcg) |

Fish/Oil or Cod Liver Oil – My favorite is cod liver oil, because it is also a good source of vitamin D and A. Supplementing with omega 3 fatty acids (EPA and DHA), due to the fact that almost everyone is deficient in them, is an important part of our health journey.

Zinc – Supplementing with zinc lozenges during a cold right from the first sign of sore throat is a good way to ensure quick recovery and shortened sick time. Some studies show that zinc may reduce the duration of cold and flu as much as 50%.

Probiotics – As I mentioned above probiotics are one of the most important parts of our immune system. If you don’t consume dairy or feel that you do not get adequate amount of probiotics in your diet, than 3 times a year it is good to take it for a month or two.

Multivitamin – Every one of us is deficient in some or most micronutrients. This is due to the fact that the soil is depleted in minerals and the chemicals used on our crops make the remaining ones unavailable for plants. Vitamins are easier to come by as plants can manufacture them but minerals and trace minerals are only present in the plant if it was available for the plants from the soil. In my opinion taking a good quality, possibly whole food multivitamin a day is a good “health insurance”.

**Stress Management**

No one is immune to stress. Despite all of the negative information about stress, it can be both beneficial and harmful. Good stress is beneficial because it provides a surge of energy and improves performance. Another example of good stress is our “fight or flight response” which takes us away from dangerous situations. Harmful stress is chronic ongoing stress with no break at all. Chronic stress affects many systems in the body. During chronic stress there is a continuous high level of stress hormone, cortisol in the blood. Overtime the body develops resistance to cortisol and inflammatory conditions develop. Chronic stress can also lead to protein deficiency as there is an increased demand for it. Cortisol and corticosteroids also suppress lymphocytes.

**Other Optional Ingredients**

Chemical Free Personal Care Products; Deep Breathing; Exercises; Laughter; Interpersonal Love; Affection and Kindness to Self and Others; Self Love; Positive Affirmations (“My body is healthy and vibrant”); Positive Attitude; Meditation; Journaling; etc.

**Essential Oils**

<https://drericz.com/frankincense-oil-benefits/>