



# Viral Pandemic: A Review of Integrative Medicine Treatment Considerations

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On March 11, 2020, the World Health Organization (WHO) declared COVID-19 a pandemic, stating there were over 118,000 cases in more than 110 countries and territories around the world. As of August 4, 2020, the WHO reported that there were 18.3 million confirmed cases with over 696,000 deaths. With great controversy over feasible treatment modalities for COVID-19, we conducted a literature review of publicly available information to summarize knowledge about various potential integrative medicine treatment options. These options include, among others, vitamin C, zinc, and zinc ionophores like Hydroxychloroquine, vitamins D3 and A, iodine, selenium, NAC, glutathione, melatonin and fibrinolytic enzymes. In this literature review, the treatment modality, immune responses, effectiveness and treatment recommendations are all reviewed with the intent of providing practitioners with applicable information to effectively treat their patients. Also, since there are various environmental factors that weaken immunity and otherwise predispose to COVID-19 illness, those factors are described here so that they can be systematically identified and resolved as much as feasible. Most skilled integrative practitioners have found that taking the environmental “load” off the patient improves the outcome in infectious illnesses.

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Since December 2019, the new severe acute respiratory syndrome, designated SARS-CoV-2 has spread across the world and has been credited with causing coronavirus disease-19 (COVID-19) pneumonia. According to the World Health Organization (WHO), as of August 4, 2020 the WHO has reported that there are 18.3 million confirmed cases with over 696,000 deaths.<sup>1</sup> Comorbidities including diabetes, hypertension, coronary artery disease, chronic obstructive lung disease or other pathologies involving the renin-angiotensin system increase the risk of mortality, particularly when coupled with advanced age.<sup>2</sup>

At this point in time there are no approved vaccines available for the prevention of SARS-CoV-2 infection and the only approved allopathic therapy other than symptomatic treatment of COVID-19 is the new drug Remdesivir at a cost of more than \$3000 for a 5-day course. While extensive research efforts are underway focused on new vaccine or pharmaceutical solutions, health care practitioners have looked for alternative solutions to meet the needs of their patient population. To that end, treatment modalities which do not require prescription medications that have been successfully utilized by healthcare practitioners in outpatient settings are discussed along with the accompanying literature reviews that support the rationale for the treatment modalities.

## ACIM Immune Support Protocol

Developed by healthcare practitioners that are members of the Academy of Comprehensive Integrative Medicine (ACIM), the protocol is a reasonable consideration for prevention of viral illness as well as outpatient treatment at the first sign of symptoms. The ACIM physician authors have each had several decades of experience treating various severe acute viral illnesses in their patients using the tools discussed in this article. This ACIM protocol may either be utilized as a comprehensive stand-alone protocol or in conjunction with other protocols. For any reader of this article seeking assistance for their own health, this article should be considered purely educational



and not prescriptive (i.e. not making a diagnosis or making a specific treatment recommendation for any reader). While the protocol is advised to be administered under a healthcare practitioner's supervision, some people may choose to self-administer the products utilized since they are naturally occurring and carry very little risk of harm. However, the authors of this publication refuse to assume any liability for any person who uses this information to treat themselves without their own physician supervising it. The layering of each of the products in the protocol provides an additive impact but implementing any component of the protocol still provides some support to the immune system. Further, it cannot be overemphasized the criticality of controlling environmental elements such as dietary factors, air and water quality, electromagnetic field exposure and sleep environment.

## Prevention and Early Treatment

As with any medical situation, prevention and early treatment is typically directly correlated to improved outcomes. The old adage, "an ounce of prevention is worth a pound of cure" is true from a financial as well as a health standpoint when it comes to treatment of COVID-19. The nutrient base of the protocol provides key support to the body's immune system so the earlier it is implemented the faster the improvement. That said, regardless of the time of administration, the nutrient base of the protocol should help patients improve their ability to heal. Each component of the protocol is described below along with key literature resources that provide additional information on the mechanism of action, historical success, etc. Table 1 provides the entire protocol for ease of reference and utilization in the practice setting.

## Literature Review of Protocol Elements.

**Zinc.** Zinc is an essential trace element that is crucial for growth, development, and the maintenance of immune function. Its influence reaches all organs and cell types, representing an integral component of approximately 10% of the human proteome.<sup>3</sup> There is copious evidence in the literature over the past 50 years that zinc is a critical factor that influences antiviral immunity as well as being a direct antiviral. Specifically, in coronavirus, Zinc inhibits the RdRp template binding and elongation whereas in Respiratory Syncytial Virus, Zinc reduces the viral titer and plaque count.<sup>3</sup> Similar to viral RdRps, zinc has also been identified as an inhibitor of retrovirus RTs.<sup>4</sup> That said, it should be noted that SARS-CoV-2, influenza, and rhinoviruses all use different cellular receptors, but the presence of ACE2 on the epithelium of the oral cavity and upper airway offers an excellent rationale for oral zinc lozenge therapy.<sup>5</sup> The earlier therapy is started, the better the outcome. Much like the data from clinical trials that demonstrate the value of zinc in reducing the duration and severity of symptoms of the common cold when administered within 24 hours of the onset of common cold symptoms,<sup>6</sup> it is critical that zinc be implemented as a preventive measure or at the first signs of illness in order to reduce viral load.<sup>7</sup> Furthermore, as zinc can be bound by phytates found in foods that contain grains, nuts, seeds, beans or corn,<sup>8</sup> it is imperative to ensure oral zinc is not taken simultaneously with foods containing phytates. This is particularly important in populations where zinc deficiency is common due to age, diet or lifestyle factors. Studies show that zinc deficiency often presents itself in the pediatric population and that zinc supplementation is effective.<sup>9</sup> Zinc deficiency occurs most frequently in the elderly, vegans/vegetarians, individuals who consume alcohol and individuals with chronic disease such as liver cirrhosis<sup>10</sup> and inflammatory bowel disease. Additionally, individuals who are obese, have high blood pressure or high cholesterol are more likely to be zinc deficient, making them higher risk for coronavirus.<sup>11</sup> Since it is difficult to get zinc into the cell, it is worth considering using a liposomal form of zinc orally. If someone is taking zinc for a prolonged timeframe without taking about 1 mg of copper for each 15 to 25 mg of zinc, it may eventually result in a copper deficiency. Copper deficiency impairs immunity and results in imbalances of the steroidal hormones in the body.

**Zinc Ionophores.** While zinc is critical to support the immune system response, it needs a zinc ionophore in order to be able to support the immune system response. An ionophore is "an entity



which is able to transport particular ions, like zinc, across a lipid membrane in a cell". Zinc is required inside the virus-infected cells to inhibit viral RNA polymerase and stop virus replication. Due to its ionic nature, zinc requires an ionophore to bind to it and transport it across the cell membrane. While pharmaceutical zinc ionophores like hydroxychloroquine and chloroquine along with ivermectin exist, natural ionophores like Quercetin and Epigallocatechin-gallate (EGCG), a bioactive ingredient in green tea, are also zinc ionophores.<sup>12</sup> Quercetin has anti-viral properties in addition to its ionophore effect which are attributed to its ability to inhibit the virus' ability to infect cells, its inhibition of viral replication in already-infected cells, and its ability to reduce infected cell's resistance to treatment with anti-viral medication.<sup>13,14</sup> An extensively well-researched article by Dr. Joseph Mercola highlights multiple well-done studies demonstrating the impact of quercetin on a wide range of viruses to include SARS, influenza, herpes simplex virus type 1, polio-virus type 1, parainfluenza virus type 3 and respiratory syncytial virus.<sup>13,15</sup> In addition, adding Ascorbic Acid (Vitamin C) increases the intracellular amount of quercetin. As a result, there is evidence that zinc, quercetin, vitamin C and vitamin D would be an effective immune support methodology against viruses. If quercetin is unavailable, Epigallocatechin-gallate (EGCG), a bioactive ingredient found in green tea, is recommended as a zinc ionophore, or use liposomal zinc to transport the zinc into the cellular compartments where it is most needed. It should be mentioned here that hydroxychloroquine has other antiviral properties in addition to its zinc ionophore effect and it has recently been shown in a very large meta-analysis to be effective in reducing mortality by 79% in COVID-19 illness.<sup>16</sup> That said, hydroxychloroquine is not totally without risk. At low doses, the cardiovascular arrhythmias and other cardiovascular effects do not appear to be prevalent. However, there are additional psychiatric effects that can happen even at low doses.<sup>17</sup>

**Vitamin C (Ascorbic Acid).** Vitamin C has extensive documentation stretching into thousands of studies showing its ability to readily cure all acute viral syndromes in which adequate dosage has been utilized.<sup>18,19</sup> Called the ultimate virucide, vitamin C has been documented to inactivate every virus against which it was tested in vitro.<sup>19</sup> In an ongoing clinical study on hospitalized COVID-19 patients, a combination of vitamin C, methylprednisolone, heparin, and thiamine resulted in a dramatic decrease in hospital mortality rate, particularly when treatment was started upon admission to the unit.<sup>20</sup> In a similar treatment regimen that included vitamin C, the in-hospital sepsis death rate was reduced from 40.4% to 8.5%.<sup>21</sup> The critical component to the success of vitamin C in the hospital setting is consistently adequate dosage which can appear to be extremely high doses, known as high dose intravenous vitamin C (HDIVC).<sup>22</sup> The possible targets of therapeutic action can be seen in Figure 2. In another recent study of HDIVC utilized on COVID-19 patients, the stay in the intensive care unit was shortened by 7.8% and the mortality rate decreased.<sup>23,24</sup> For individuals who are not hospitalized, oral vitamin C taken every two hours up to bowel tolerance has been shown to achieve good therapeutic impact. Liposomal vitamin C has also been demonstrated to be of therapeutic benefit, shortening the duration of viral illness.

**Vitamin D3.** Extensive research exists documenting vitamin D's role in decreasing risk of infection from pathogens as well as strengthening immune function. Over a decade ago low vitamin D levels were identified as a pandemic.<sup>25</sup> While vitamin D has not been shown to mitigate viruses independently, it is critical for prevention as well as recovery, significantly lowering the risk of mortality in COVID-19.<sup>26,27</sup> Acute Respiratory Distress Syndrome (ARDS), a significant complication of COVID-19, is much more prevalent with vitamin D deficiency.<sup>28</sup> Conversely, a study of older patients admitted to the hospital with COVID-19 who were treated with vitamin D, magnesium and vitamin B12 was associated with a significant reduction in proportion of patients with clinical deterioration requiring oxygen support and/or intensive care support.<sup>29</sup> Given the current chronically low levels of vitamin D that have been identified around the world, ensuring vitamin D levels are between 50-80 ng/ml is a critical prevention step in lowering the risk of severe COVID-19 infection. As it takes time to increase vitamin D levels, it is strongly encouraged that individuals supplement vitamin D in accordance with the guidance given in Table 1 and have their blood levels checked by utilizing the 25-hydroxy-vitamin D lab test about 30 days after initiating vitamin D3 supplementation.



**Vitamin A.** Vitamin A deficiency results in multiple derangements that impair the response to infection. Vitamin A deficiency impairs innate immunity by impeding normal regeneration of mucosal barriers damaged by infection and by diminishing the function of neutrophils, macrophages, and natural killer cells. Vitamin A is also required for adaptive immunity and plays a role in the development of both T-helper (Th) cells and B-cells.<sup>30</sup> Individuals who are deficient in vitamin A are found to have a poor innate and specific response to viruses and are prone to secondary infections.<sup>30</sup>

**Magnesium.** Magnesium has been documented to have substantial antipathogenic properties and has been reported to cure poliovirus infections as a monotherapy when ingested orally.<sup>31</sup> Out of 30 full-text articles, 6 studies involving 1550 intensive care unit participants were included in a meta-analysis evaluating magnesium levels. The findings indicated hypomagnesemia is associated with higher mortality, the need of mechanical ventilation and also the length of ICU stay was increased by four days.<sup>32</sup>

**Proteolytic Enzymes.** Medical practitioners have reported heart problems, kidney problems, and the presence of blood clots in many COVID-19 cases. Patients that have recovered from COVID-19 also appear to be at higher risk for blood clot related issues. According to a research article published April 8, 2020: “A hallmark of severe COVID-19 is coagulopathy, with 71.4% of patients who die of COVID-19 meeting ... criteria for disseminated intravascular coagulation (DIC)... predominantly pro-thrombotic DIC with high venous thromboembolism rates, elevated D-dimer levels, high fibrinogen levels in concert with low anti-thrombin levels, and pulmonary congestion with microvascular thrombosis and vascular occlusive events (e.g. ischemic limbs, strokes, etc.).”<sup>33</sup> Proteolytic enzymes such as lumbrokinase, nattokinase and serrapeptase act as natural anticoagulants that break down the fibrin, inhibit platelet aggregation and/or interfere with components of blood coagulation cascade as well as have an anti-inflammatory impact on the tissue inflammation that contributes to the blood clot formation.<sup>33</sup> Examples of proteolytic/fibrinolytic enzymes include bromelain, lumbrokinase, nattokinase and serrapeptase. If these are taken during a meal, they help to digest the food of that meal. If these enzymes are taken orally with only water at least 30 minutes before a meal (and several hours after the previous meal), some of the enzymes will be absorbed intact into the blood stream where they can have a fibrinolytic effect.

**Bromelain.** In vitro and in vivo studies demonstrate that bromelain exhibits various fibrinolytic, antiedematous, antithrombotic, and anti-inflammatory activities. Used for the treatment of angina pectoris, bronchitis, sinusitis, surgical trauma, thrombophlebitis and debridement of wounds, bromelain is typically derived from the pineapple stem.<sup>34</sup> It enhances absorption of drugs (particularly antibiotics) and has been used to relieve osteoarthritis, diarrhea, and various cardiovascular disorders. Bromelain also acts as an immunomodulator by raising the impaired immuno-cytotoxicity of monocytes against tumor cells from patients and by inducing the production of distinct cytokines such as tumor necrosis factor- $\alpha$ , certain interleukins (Il-1 $\beta$ , Il-6, and Il-8).<sup>34</sup>

**Lumbrokinase.** A highly effective antithrombotic agent that reduces blood viscosity and platelet aggregation, lumbrokinase also degrades fibrin, a key factor in clot formation.<sup>35,36,37</sup> Its antiplatelet activity protects against cerebral ischemia.<sup>38</sup> Around 300 times stronger than serrapeptase, and nearly 30 times stronger than nattokinase, it is a powerful fibrinolytic enzyme.<sup>39</sup> However, since lumbrokinase is a complex enzyme preparation extracted from earthworms, the strength and specific characteristics will vary based upon the species, extraction technique, etc.<sup>40</sup>

**Nattokinase** is a strong thrombolytic that breaks down blood clots by dissolving excess fibrin.<sup>41</sup> It has been used successfully as an oral thrombolytic agent for preventing cardiovascular disease.<sup>42</sup> The bacteria *Bacillus subtilis* produces nattokinase when soybeans are fermented to make natto.<sup>43</sup>

(serratiopeptidase) helps patients with chronic airway disease by reducing coughing and lessening viscosity of sputum.<sup>44</sup> It is produced in the gut of newborn *Bombyx mori* silkworms to aid them in dissolving and escaping from their cocoons. Like the other proteolytic enzymes, serrapeptase is



fibrinolytic with an impressive history of utilization in the post-surgical setting.<sup>45</sup>

**Nascent Iodine.** Iodine deactivates coronavirus quickly at very low concentrations.<sup>46</sup> Published scientific analyses confirm that iodine intake needs to attain the safe upper limit specified by the United Nations Food and Agricultural Organization (FAO) in order to be effective against viruses.<sup>47</sup> The FDA's Recommended Daily Allowance (RDA) is too low to achieve efficacy. The FAO dose is weight dependent at 30 micrograms of iodine per kilogram of body mass - 13.6 mcg/lb. For a 70kg (154 lb) person, the amount is 2100 micrograms. Iodine is currently being used in some Pacific Rim countries as a nasal treatment as well as a preventative. The literature further reports that iodine is one of the World Health Organization's listed essential medicines and is on the CDC's reference list of COVID disinfectants.

**Melatonin.** In COVID-19 illness, much of the tissue injury that results are caused by excessive inflammatory response and subsequent oxidative damage. Melatonin is effective in reducing oxidative stress through multiple mechanisms to include direct detoxification of reactive nitrogen and oxygen nitrogen species as well as indirectly by stimulating antioxidant enzymes while suppressing the activity of pro-oxidant enzymes.<sup>48</sup> High concentrations of melatonin in mitochondria likely aid in its capacity to resist oxidative stress and cellular apoptosis. Its capacity to prevent oxidative damage and the associated physiological debilitation is well documented in numerous experimental ischemia/reperfusion (hypoxia/reoxygenation) studies especially in the brain (stroke) and in the heart (heart attack).<sup>48</sup> Melatonin has been effectively used to combat oxidative stress, inflammation and cellular apoptosis and to restore tissue function in a number of human trials.<sup>49,50</sup>

**Glutathione.** Oral and IV glutathione as well as N-acetyl-cysteine (NAC is a glutathione precursor), and alpha-lipoic acid may each represent a novel treatment approaches for blocking NF-KappaB and addressing "cytokine storm syndrome" and respiratory distress in patients suffering with COVID-19 pneumonia.<sup>51</sup> In the lung, glutathione exists in high concentrations in the extracellular fluid. It neutralizes reactive oxygen species and keeps the mucous less viscous by breaking disulfide bonds, as well as combining with nitric oxide to make nitrosogluthathione, an endogenous bronchodilator. In preclinical models of sepsis and acute lung injury, which are associated with rapid and large increases in pro-inflammatory cytokines and other mediators, the suppression of NF-κB activation has been shown to result in improved survival.<sup>52</sup> NAC, alpha-lipoic acid and glutathione all inhibit TNF-α-induced NF-kappaB activation. Oral and IV glutathione as well as N-acetyl-cysteine and alpha-lipoic acid may represent a novel treatment approach for blocking NF-KappaB and addressing "cytokine storm syndrome" and respiratory distress in patients suffering with COVID-19 pneumonia.<sup>52</sup>

**Selenium (Se).** A potent nutritional antioxidant that carries out biological effects through its incorporation into selenoproteins, selenium assists to regulate reactive oxygen species (ROS) and redox status in nearly all tissues, influencing inflammation and immune responses.<sup>53</sup> Researchers identified a significant association between COVID-19 prognosis and regional selenium status in China.<sup>54</sup> Selenium has a narrower therapeutic to toxic ratio than most other nutrients; therefore, it is usually wise to not exceed 400 mcg per day in an adult patient.

Literature Review of Environmental Considerations.

**Dietary Factors.** The gut microbiota plays a key role in regulating the immune system. The majority of your body's entire immune system resides in your gut-associated lymphoid tissue (GALT). Since pathologic microbes in the gut can adversely affect the gut immune cells, gut dysbiosis is a common feature of infectious diseases. Dietary approaches focused on building and supporting a healthy microbiota benefits the immune system. There is evidence from acute respiratory distress syndrome (ARDS) in other settings that the cytokine storm can be controlled by omega-3 fatty acids, possibly through their metabolism to specialized pro-resolving mediators.<sup>55</sup> **For adults that are experiencing viral symptoms, vegetable juices (or pure water with a dash**



of sea-salt) 2oz. every 15 min. orally each waking hour may be helpful. Sugar, refined and processed foods or omega-6 and partially-hydrogenated vegetable oils can increase severity of viruses due to increasing inflammatory factors. Malnourishment can exasperate an impaired immune system in the elderly, making them susceptible to infections.<sup>56</sup> A healthy, balanced diet can offer the necessary macro- and micronutrients, prebiotics, probiotics, and symbiotics that can restore and maintain immune cell function, thus increasing protection against chronic inflammation.<sup>57</sup>

**Air Quality.** Air pollution has been linked to acute respiratory inflammation, asthma attacks, COPD exacerbation, and death from cardiorespiratory diseases by various studies.<sup>58</sup> Research has also demonstrated a relationship between air pollution and SARS case fatality in an ecologic study design.<sup>59</sup> A Harvard analysis is the first nationwide study to show a statistical link, revealing a “large overlap” between COVID-19 deaths and other diseases associated with long-term exposure to fine particulate matter. “The results of this paper suggest that long-term exposure to air pollution increases vulnerability to experiencing the most severe COVID-19 outcomes,” the authors wrote.<sup>60</sup> Most fine particulate matter comes from fuel combustion, like automobiles, refineries and power plants, as well as some indoor sources like tobacco smoke, mold spores, dust, etc. Inhaling such microscopic pollutants, experts said, inflames and damages the lining of the lungs over time, weakening the body’s ability to fend off respiratory infections. Air-conditioning is an additional factor that increases the likelihood of virus particles in the air due to the air being cool, dry and recirculated.<sup>61</sup> In order to ameliorate air pollution risk factors along with removing viral particles from the air, personal air ionizers worn on the neck, along with medical grade HEPA air filtration systems operating in the home and workplace should be utilized to clean indoor air.

**Water Quality.** Water is not only essential to life but intimately interwoven with quality of life. Access to clean water free of chemical, biological and radiological contaminants is crucial in order to support a healthy immune system. While coronaviruses have not been found to be an issue in drinking water, coronaviruses can remain infectious for long periods in water and pasteurized settled sewage, suggesting contaminated water is a potential vehicle for human exposure if aerosols are generated.<sup>62</sup> *Care should be taken to secure clean drinking water, preferably spring water from a clean source or bottled in glass bottles in order to avoid exposure to contaminants present in plastic bottles. Alternatively, reverse osmosis water is acceptable as long as trace minerals are added in order to ensure that the body retains adequate mineral content.*

**Electromagnetic Fields.** The definition of an electromagnetic field (EMFs) is the invisible field of electromagnetic radiation on the spectrum of energetic particles that move as quanta (radiowaves, infrared, visible light, UV light and gamma radiation). EMFs are generated by moving electric charges that propagate outward from any object carrying an electric current.<sup>63</sup> Exposure can suppress immune function and an increasing number of individuals are becoming sensitive or reactive to EMFs.<sup>64</sup> In order to maintain immune system function, it is critical to reduce or eliminate exposure to EMF’s by shutting off Wi-Fi routers and hard-wiring computers, home protection systems, etc. Using EMF shielding on cell phones along with EMF Radiation-Free Air Tube Earbud Headphones is also helpful to reduce EMF exposure. In lieu of using cordless phones, it would be better to use a wired phone line with wired handset. For individuals who live near cell towers or have extensive health issues, utilizing materials that block EMF signals in the sleep space is beneficial. The Bioinitiative Report<sup>65</sup> is comprehensive in nature, providing well-documented and researched science on EMF’s and the Environmental Health Trust<sup>66</sup> has extensive information and resources available on the topic of EMF’s.

**Sleep Factors.** Sleep and the circadian system have a strong impact on the immune system. A bidirectional communication exists between the central nervous and immune system that is comprised of signals (neurotransmitters, hormones and cytokines) along with direct innervation by the autonomic nervous system. The endocrine milieu during early sleep is believed to promote the initiation of Th1 immune responses that eventually supports the formation of long-lasting immunological memories.<sup>67</sup> Prolonged loss of sleep and the accompanying stress response increase



the production of pro-inflammatory cytokines (chronic low-grade inflammation) and produce immunodeficiency. One study demonstrated that the immune response to vaccination against influenza virus was diminished after 6 days of restricted sleep.<sup>68</sup> Additionally, there is correlation demonstrating enhanced susceptibility to the common cold with poor sleep efficiency.<sup>69</sup> There are simple, sleep-optimizing steps that can be taken that will result in improved immune system function. Minimizing the use of electronic devices at night and avoiding the effect of blue light on the secretion of melatonin at night are two things that can ensure good sleep.<sup>70</sup> Dim, red lighting that simulates firelight or wearing blue-light blocking glasses, etc. are also helpful after sunset. Additionally, using applications or programs that change the electronic screen from 6500 kelvin (direct sunlight at noon is 5500 kelvin) to 1900 kelvin (candlelight).<sup>70</sup> The sleep space should be cool and completely dark so that the individual cannot see their hand in front of their face at night. Noise should be eliminated by either using ear plugs or turning off any and all devices that create vibration. *Maintaining healthy sleep habits like a routine bedtime before 10 pm and not eating for at least two hours before bedtime along with a restorative sleep environment provides critical support to the health of the immune system, increases resiliency and reduces the chance of becoming severely ill from an infection.*

## Conclusion

In this literature review, the environmental contributions to illness, immune responses, and treatment recommendations were reviewed with the intent of providing practitioners actionable information to effectively treat their patients as well as providing patients information that they can utilize to educate their health care practitioner. With the ample medical literature available, it is readily evident that there are many nutraceuticals that are effective for preventing and treating viruses in early stages of exposure. The modalities addressed in this article are directed towards therapies that may be administered at home. Integrative medicine has many other treatment modalities that can be used in a clinical setting that are not addressed in this article. There is ample medical literature demonstrating the capability of nutraceuticals to reduce viral morbidity and lower mortality. While a medication like Hydroxychloroquine is effective, it can be difficult for many to access and may have health complications for some individuals. From the published research literature reviewed here, one can see that consuming certain supplemental nutrients, along with dietary and environmental support measures can support the human immune system and reduce risk of infections. It would therefore seem prudent for individuals to routinely consume sufficient amounts of essential nutrients from diet and supplements to support their immune system and to help prevent infection or minimize health consequences should they become infected by a virus. In addition to nutritional support, focusing on environmental support through air quality, water quality and minimizing EMF exposure is critical for good health. One's health can be further enhanced with good sleep, routine exercise, laughter and taking time to enjoy loving relationships and the outdoors. By incorporating these simple lifestyle steps, individuals can successfully improve their immune system and remain resilient.

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## Tables

Supplement	Dosage	Timing	Notes
Zinc	50 mg	2 times daily	Ideally Citrate or Gluconate*
Copper	2 mg	1 times daily	Zinc/Copper ratio key to immunity
Quercetin	500 mg	2 times daily	EGCG 300 mg (green tea extract) may be used in lieu of Quercetin**
Ascorbic Acid (Vitamin C)	2,000 mg	Every 2 hours	Increase dose by 2,000mg every 2 hours while awake until loose stool***
Vitamin D3	4,000-6,000iu	1 time daily	Levels should be checked within 30 days (see notes below)****
Vitamin A (emulsified)	20,000-25,000iu	1 time daily	Initial dosage 100,000iu for 5 days, 20,000iu maintenance 7 days after symptoms cease
Magnesium (Malate or Citrate)	2 caps daily	Use if not using magnesium ascorbate (in lieu of Vitamin C)	
Nascent Iodine	6 drops (667 mcg/drop)	1 time daily in water	Build from 1 drop daily to 6 drops daily over time away from Vitamins C,D,A, melatonin or glutathione
Proteolytic Enzymes	Specific to Enzyme+	Empty stomach 30 min before food & bedtime	See notes below++
Melatonin	3-20 mg slow release	At bedtime	Bedtime is best at 9pm due to immune system detoxifies between 9-11 pm.
3% Hydrogen Peroxide	Specific to prevention/illness	¼ tsp mixed with ¾ tsp distilled water	See notes below+++
Glutathione	Specific to prevention/illness	500 mg 1 hour after 3% Hydrogen Peroxide	See notes below++++

Table 1. ACIM Immune Support Protocol for Adults

Notes: Pediatric dosages may be estimated by calculating dosage based upon weight underneath the supervision of your healthcare practitioner. The average adult weight of 155 lbs. is utilized for the estimates that are listed in the table.

\*Zinc should not be taken with foods containing phytates (grains, nuts, seeds or corn).

\*\*Quercetin/EGCG are Zinc Ionophores that serve the same function as Hydroxychloroquine. ECGC (Epigallocatechin-gallate) is the active ingredient in green tea extract.

\*\*\*Ascorbic Acid (Vitamin C) orally to bowel tolerance or IV Vitamin C. Loose stools is 3-4 bowel movements daily. Magnesium ascorbate may be used if kidney function and serum creatinine is normal. If pink/reddish urine is noted, stop Vitamin C until serum G6PD can be verified or wait 12



hours and attempt to resume at ¼ of previous dose. 1 tsp Liposomal Vitamin C (1,000mg ascorbic acid/tsp) 3x daily is typically well tolerated even when G6PD is low and can be taken the same day as other Vitamin C. Oral Vitamin C administered as described here can be effective without access to IV Vitamin C.

\*\*\*Vitamin D3 if not previously supplemented and/or levels are below 50 ng/ml, consider bolus dose of 100,000 iu followed by 4,000 iu (small adult)- 6,000 iu (large adult) daily. Test serum Vitamin D3 levels within 30 days of beginning protocol. Test is 25-hydroxy-Vitamin D through Lab Corp (not Quest Lab). Ideal level is between 50-80 ng/ml.

+Proteolytic Enzymes dosage per occurrence is dependent upon enzyme. 1500 mg Bromelain, 300 mg Papain, 12,000 FU Nattokinase, 80 mg Lumbrokinase or 120,000 SPU Serrapeptase. If stomachache note <https://academic.oup.com/ajcn/article/111/6/1297/5826147d>, switch to another enzyme to avoid intolerance or rotate to a different enzyme each day, not using the same enzyme more than one day every 4 days.

++Proteolytic Enzymes are for clot prevention and not necessary if other anticoagulants are utilized.

+++3% Hydrogen Peroxide must be only hydrogen peroxide. Use nebulizer with mask if possible. Use every 12 hours for prevention, every 3-4 hours for treatment if short of breath.

Solution can also be administered by placing in spray bottle & spraying into open mouth while breathing in (it will take several sprays and deep breaths).

++++ Glutathione is best nebulized one hour after 3% hydrogen peroxide. 500 mg glutathione (1/4 tsp) with 1 tsp distilled water. Alternatively, the solution can be held in the mouth for 4 minutes and then swallowed. Selenium 200 mcg per day by mouth may be added to make glutathione peroxidase and selenoproteins to reduce inflammation and support immunity.