



IMMUNE SUPPORT

NUTRITIONAL GUIDE



VITAMIN D3

- “The researchers found 80 percent of 216 COVID-19 patients at the Hospital Universitario Marqués de Valdecilla had vitamin D deficiency, and men had lower vitamin D levels than women. COVID-19 patients with lower vitamin D levels also had raised serum levels of inflammatory markers such as ferritin and D-dimer.”
- <https://www.endocrine.org/news-and-advocacy/news-room/2020/study-finds-over-80-percent-of-covid-19-patients-have-vitamin-d-deficiency>
- Food sources: Oily Fish, Cheese, egg yolks, beef liver. Sun exposure

SELENIUM

- Selenium (Se) is a ubiquitous element akin to sulfur (S) existing in the Earth crust in various organic and inorganic forms. Selenium concentration varies greatly depending on the geographic area. Consequently, the content of selenium in food products is also variable. It is known that low Se is associated with increased incidence of cancer and heart diseases. Therefore, it is advisable to supplement diet with this element albeit in a proper form. Although blood increased concentrations of Se can be achieved with various pharmacological preparations, only one chemical form (sodium selenite) can offer a true protection. Sodium selenite, but not selenate, can oxidize thiol groups in the virus protein disulfide isomerase rendering it unable to penetrate the healthy cell membrane. In this way selenite inhibits the entrance of viruses into the healthy cells and abolish their infectivity. Therefore, this simple chemical compound can potentially be used in the recent battle against coronavirus epidemic.
- <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7246001/#:~:text=In%20addition%2C%20selenium%20reduces%20the,in%20patients%20with%20COVID%2D19.>
- Food sources: Brazil nuts, seafoods, and organ meats are the richest food sources of selenium

BOOST IMMUNITY

ZINC

Zinc contributes to immune defense by supporting various cellular functions of both the innate and adaptive immune system. There is also evidence that it suppresses viral attachment and replication. Zinc deficiency is common, especially in those populations most at risk for severe COVID-19 infections, and it is challenging to accurately diagnosis with laboratory measures. Supplementation with zinc is supported by evidence that it both prevents viral infections and reduces their severity and duration. Moreover, it has been shown to reduce the risk of lower respiratory infection, which may be of particular significance in the context of COVID-19.

Food Sources:

Foods high in zinc include oysters, beef, chicken, tofu, pork, nuts, seeds, lentils, yogurt, oatmeal, and mushrooms.

The current daily value (DV) for Zinc is 11mg.

BOOST IMMUNITY

VITAMIN C

Vitamin C contributes to immune defense by supporting various cellular functions of both the innate and adaptive immune system. Vitamin C accumulates in phagocytic cells, such as neutrophils, and can enhance chemotaxis, phagocytosis, generation of reactive oxygen species, and ultimately microbial killing. Supplementation with vitamin C appears to be able to both prevent and treat respiratory and systemic infections.^[120] Vitamin C has been used in hospital ICUs to treat COVID-19 infection.

Food Sources:

High vitamin C foods include guavas, bell peppers, kiwifruit, strawberries, oranges, papayas, broccoli, tomatoes, kale, and snow peas.

The current daily value (% DV) for vitamin C is 90mg. Therapeutic doses are 1000 mg to 3000 mg for adults in divided doses.

BOOST IMMUNITY

N-ACETYLCYSTEINE (NAC)

N-acetylcysteine promotes glutathione production, which has been shown to be protective in rodents infected with influenza. In a little-noticed six-month controlled clinical study enrolling 262 primarily elderly subjects, those receiving 600 mg NAC twice daily, as opposed to those receiving placebo, experienced significantly fewer influenza-like episodes and days of bed confinement.^[36]

Food Sources:

These nutrients can be found in beans, lentils, spinach, bananas, salmon and tuna. While most protein-rich foods, such as chicken, turkey, yogurt, cheese, eggs, sunflower seeds and legumes, contain cysteine, some people choose to supplement with NAC to increase their cysteine intake.

The accepted daily supplement recommendation is 600–1,800 mg of NAC.



- NAC

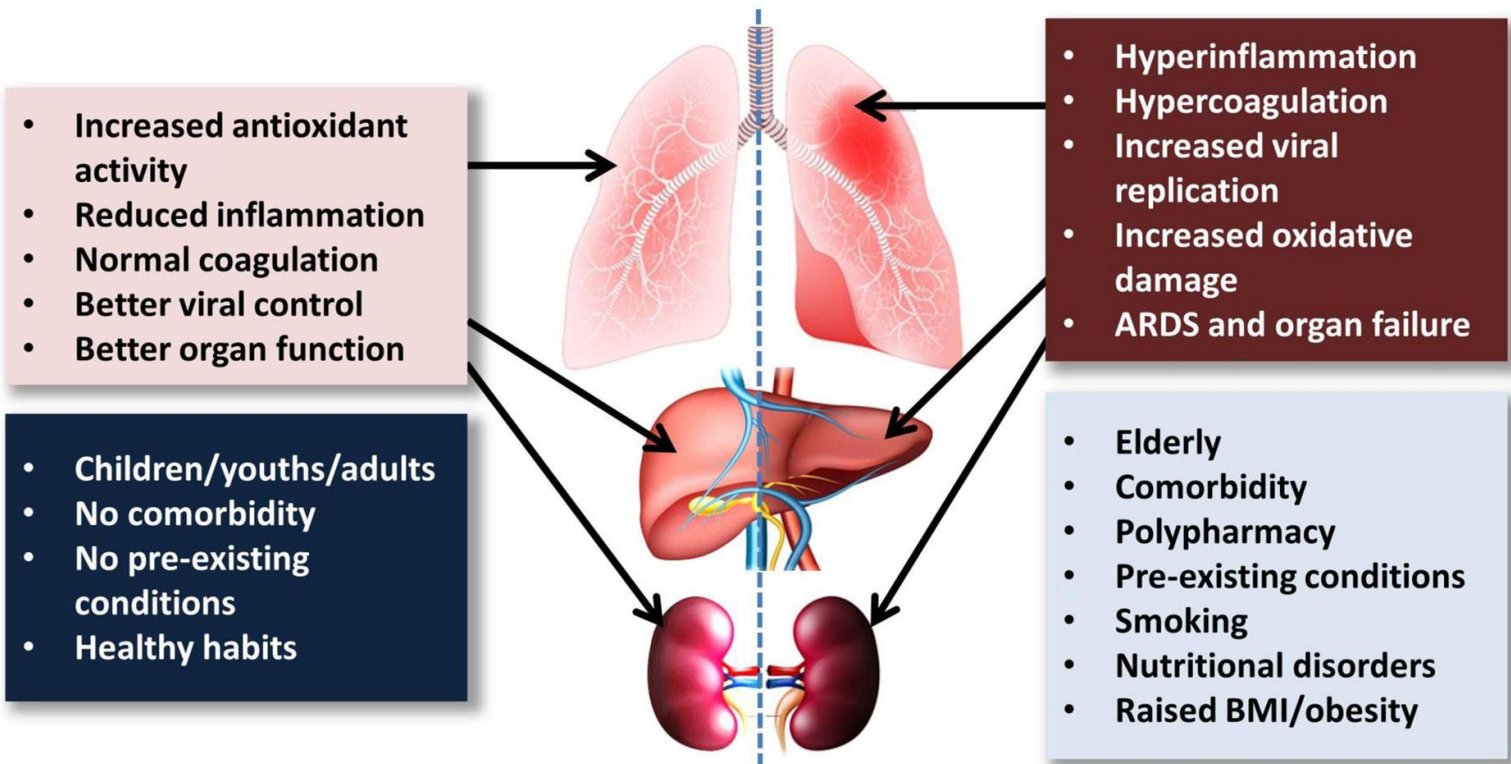
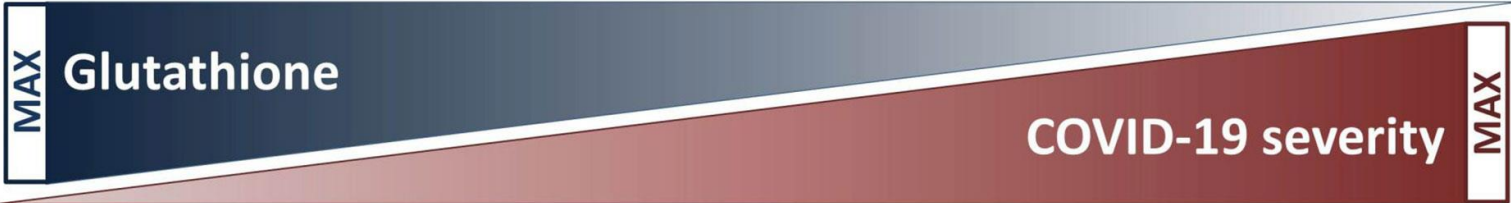
- Oral administration of NAC (600 mg/day) could function as a preventive measure, particularly in those repeatedly exposed to possible SARS-CoV-2 carriers (e.g., health workers). This application could be a particularly urgent approach since, despite the use of personal protective equipment, healthcare workers in the USA, Italy, China, Mexico, etc., have become infected while caring for hospitalized patient. Other workers who, due to their job requirements, cannot work at home and/or ensure self-isolation might also benefit from preventive use of NAC administration. If deemed effective, this latter use could potentially help to flatten the exponential contagion curve in several countries. More clinical trials would clearly be needed to validate this application.

- COVID-19 may cause pneumonia, acute respiratory distress syndrome, cardiovascular alterations, and multiple organ failure, which have been ascribed to a cytokine storm, a systemic inflammatory response, and an attack by the immune system. Moreover, an oxidative stress imbalance has been demonstrated to occur in COVID-19 patients. N-Acetyl-L-cysteine (NAC) is a precursor of reduced glutathione (GSH). Due to its tolerability, this pleiotropic drug has been proposed not only as a mucolytic agent, but also as a preventive/therapeutic agent in a variety of disorders involving GSH depletion and oxidative stress. At very high doses, NAC is also used as an antidote against paracetamol intoxication. Thiols block the angiotensin-converting enzyme 2 thereby hampering penetration of SARS-CoV-2 into cells. Based on a broad range of antioxidant and anti-inflammatory mechanisms, which are herein reviewed, the oral administration of NAC is likely to attenuate the risk of developing COVID-19, as it was previously demonstrated for influenza and influenza-like illnesses. Moreover, high-dose intravenous NAC may be expected to play an adjuvant role in the treatment of severe COVID-19 cases and in the control of its lethal complications, also including pulmonary and cardiovascular adverse events.

NAC



PAC



BOOST IMMUNITY

Probiotics

Probiotics may help give your immune system a boost and inhibit the growth of harmful gut bacteria. Also, some probiotics have been shown to promote the production of natural antibodies in the body.

Food Sources:

The most common fermented foods that naturally contain probiotics, or have probiotics added to them, include yogurt, kefir, kombucha, sauerkraut, pickles, miso, tempeh, kimchi, sourdough bread and some cheeses.

The recommended doses range from 1 billion to 20 billion colony-forming units (CFU)—the amount contained in a capsule or two—several days per week.

PROBIOTIC RESEARCH

In summary, orally administered probiotic strains can reduce the incidence and severity of viral RTIs. At a time when doctors are using drugs with little anti- COVID-19 data, probiotic strains documented for anti-viral and respiratory activities (not low-quality undocumented imitations) should become part of the armamentarium to reduce the burden and severity of this pandemic. Government funding is being used to test numerous drugs but just as important, they should fund probiotic trials. In addition, use of recognized prebiotics (e.g., fructans, galactans) to enhance propagation of probiotic strains and indigenous beneficial microbes should be recommended as part of the overall strategy to flatten the curve (11, 50).

BOOST IMMUNITY

EPIGALLOCATECHIN GALLATE (EGCG)

Green tea, in addition to modulating the NLRP3 inflammasome and, based on a preprint, potentially targeting the SARS-CoV-2 main protease to reduce viral replication, has also been shown to prevent influenza in healthcare workers.

Food Sources:

Though EGCG is predominantly found in green tea, it also exists in small amounts in other foods, such as: Tea: green, white, oolong, and black teas. Fruits: cranberries, strawberries, blackberries, kiwis, cherries, pears, peaches, apples, and avocados. Nuts: pecans, pistachios, and hazelnuts.

There is currently no clear dosage recommendation for EGCG, though 800 mg daily for up to 4 weeks has been used safely in studies.

BOOST IMMUNITY

QUERCETIN

Quercetin has been shown to have antiviral effects against both RNA (e.g., influenza and coronavirus) and DNA viruses (e.g., herpesvirus). Quercetin has a pleiotropic role as an antioxidant and anti-inflammatory, modulating signaling pathways that are associated with post-transcriptional modulators affecting post-viral healing.

Food Sources:

Quercetin is contained in abundance in apples, honey, raspberries, onions, red grapes, cherries, citrus fruits, and green leafy vegetables. Among vegetables and fruits, quercetin content is highest in onions.

The most common dose is 500 mg per day, but some people can take up to 1,000 mg per day. Supplements may also include other substances, such as bromelain or vitamin C, which may help the body absorb quercetin more effectively.