

FAQ: Zinc Supplementation, Immunity, and COVID-19

Zinc is an essential mineral. Ever since zinc deficiency was discovered as a human disease characterized by hypogonadism, dwarfism, various skin lesions and immunodeficiency, there has been a robust interest in understanding the mechanism by which zinc and its transporters are involved in human immunity.^{1,2} In developing countries, there is evidence that zinc supplementation may reduce the risk of pneumonia and diarrhea in children.³ There are two systematic reviews that suggest zinc supplementation may reduce the duration of symptoms of the common cold, which is often caused by a coronavirus. One of these reviews included 17 trials that compared zinc supplementation to placebo and found that patients receiving zinc had a shorter duration of cold symptoms (mean difference of 1.65 days, 95% confidence interval - 2.5 to -0.81); however, heterogeneity was high among the trials and this effect was not seen in children.⁴ Another systematic review included 13 placebo-controlled comparisons and found that only those trials with daily doses of over 75mg showed a reduction in the duration of colds.⁵ The heterogeneity of the studies included in this systematic review was also high; therefore, these results should be confirmed in further studies. There are *in vitro* studies which show zinc ions inhibit SARS-coronavirus (SARS-CoV) replication in viral culture.⁶ Currently, there are no available data to suggest these *in vitro* findings would translate to a clinical therapeutic. These kind of *in vitro* studies help guide future drug development research and are not meant to guide clinical practice.

Ultimately, these data have served as the basis for testing whether oral zinc supplementation could serve as a potential treatment for COVID-19. There are currently [on-going clinical trials](#) evaluating the impact of zinc supplementation alone and in combination with hydroxychloroquine for treatment and prevention of COVID-19.

In regards to dosing, humans are tolerant of doses up to 10 times the recommended daily dose by the WHO (daily recommended dose = 8-11mg elemental zinc per day for adults). However, high doses can cause gastrointestinal side effects including nausea, vomiting, diarrhea, and a bad taste. It is also important to note that intranasal zinc formulations can cause irreversible hyposmia and anosmia.⁷ Long-term zinc supplementation can cause reversible copper deficiency and neurologic manifestations such as myelopathy, paresthesia, ataxia, and spasticity that may be irreversible.⁸⁻¹¹ In addition, zinc supplements can also interact with some oral cephalosporins, fluoroquinolones, tetracyclines and some antivirals.¹¹

The July 17 update of the NIH guidelines state that there is insufficient evidence to recommend either for or against the use of zinc for the treatment of COVID-19. The guidelines also issued a recommendation that zinc supplementation above the recommended daily dietary allowance should not be used for the prevention of COVID-19 outside of a clinical trial (BIII).¹¹ The guideline panel's rationale for these recommendations were based on insufficient efficacy data for zinc and its potential to cause harm. The DASON team agrees with the guideline panel recommendations and does not endorse zinc for the treatment or prevention of COVID-19.

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References:

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