



# AIS SPORTS SUPPLEMENT FRAMEWORK

## ZINC

### What is it?

- > Zinc is a trace element, widely distributed in the human body that plays a critical role in carbohydrate and fat metabolism, as well as immune function and expression of genetic information. More than 85% of total body zinc is found in skeletal muscle and bone.
- > Zinc has an important role in immune system function,<sup>2</sup> and in line with this, zinc deficiency has been associated with increased infection risk, particularly in developing countries.<sup>2-3</sup> Zinc has been found to inhibit replication of rhinovirus (the most frequent cause of the common cold)<sup>7</sup> in vitro, however this has not been proven in vivo to date.<sup>3,6</sup>
- > The body cannot produce its own source of zinc and therefore it relies on absorbing the zinc we consume as part of our diet or supplements. The recommended daily intakes of zinc for adults are:
  - ♂ – 14 mg per day
  - ♀ – 8 mg per day
- > Almost 80% of daily zinc intake in western populations comes from meat, fish, poultry, fortified breakfast cereals & milk. In general, zinc intake correlates well with protein intake.
- > Zinc supplementation may result in reduced duration of common cold symptoms, by up to 42%.<sup>1,6</sup>

### What does it look like?

- > Predominantly available as a tablet or as a lozenge.
- > Intranasal zinc and zinc syrup have also been used.<sup>6</sup>
- > Multiple different zinc salts are available and marketed, potentially causing confusion. Elemental (or ionic) dose equivalents listed below.
  - Zinc Acetate: 50 mg (15 mg elemental zinc)
  - Zinc Gluconate: 50 mg (7 mg elemental zinc)
  - Zinc Sulfate: 55 mg (12.5 mg elemental zinc)
  - Zinc Oxide: 50 mg (40 mg elemental zinc)
  - Zinc Citrate: 50mg (15mg elemental zinc)
  - Note: dosages discussed in this document refer to the elemental dose of zinc
- > Zinc acetate has the most evidence, although other preparations have also shown efficacy.
- > There is more available research on zinc lozenges than zinc tablets, although the available evidence for tablets appears similar to lozenges.<sup>9</sup>
- > Combination zinc and vitamin C formulations are also available and marketed for treatment or prevention of upper respiratory tract infections.
  - Please refer to the [vitamin C fact sheet](#) to review the evidence and guidelines for Vitamin C supplementation.

### How and when do I use it?

- > For the management of common cold symptoms, the recommended protocol of usage is: 5 day duration, started as soon as possible (preferably within 24 hours) after onset of infective symptoms suggestive of a common cold.
  - A common cold is a clinical syndrome of mild upper respiratory tract infection that can be caused by a number of viruses.<sup>5</sup>
- > Evidence for the most appropriate dosage is unclear, but the best support is for zinc acetate at a dose of 75mg/day or greater (of elemental zinc).<sup>1,6</sup> There is no evidence of greater efficacy for doses over 100mg/day of zinc, therefore a dose of 75-100mg/day of elemental zinc is recommended.
- > It must also be noted that the use of zinc is only indicated for the treatment of common cold viruses, not other infections such as bacterial respiratory tract infections or more sinister viral infections such as influenza or COVID-19. Careful consideration should be given to ensuring more sinister infections are excluded (either clinically or with specific testing), noting that the symptom severity of COVID-19 symptoms can vary widely and may be misinterpreted as the common cold by some people.



## Are there any concerns or considerations?

### 1. Use of zinc supplementation without medical guidance could lead to misdiagnosis

- > Symptoms of a common cold (that may warrant the use of zinc) are often non-specific and overlap with illnesses that may require antibiotics (certain bacterial illnesses) or other medical investigation/intervention. This includes the need for isolation due to an infective illness (e.g., with influenza or COVID-19).
- > The use of zinc supplementation should be under medical guidance and must not replace or interfere with other standard practices of illness assessment and management.

### 2. Different zinc preparations and dosing may cause confusion

- > Multiple different preparations (zinc salts) and dosages used limit the comparability of studies to date.
- > Doses are quoted as the elemental zinc dose, however the available dose may differ as some lozenges contain compounds that more tightly bind zinc ions.<sup>1</sup>
- > The majority of research has been on zinc lozenges, but there is little direct comparison of zinc lozenges compared to tablets.

### 3. Side effects- largely mild but worth noting

- > Bad taste, nausea and constipation have been reported following zinc supplementation.<sup>1,6,8</sup>
- > Copper deficiency has also been reported with long term high dose zinc supplementation, presumably because of competitive absorption within the gastrointestinal tract.<sup>4</sup>

## Where can I find more information?

Supplement safety information

[www.sportintegrity.gov.au/what-we-do/anti-doping/supplements-sport](http://www.sportintegrity.gov.au/what-we-do/anti-doping/supplements-sport)



## References

1. Hemilä, H. Zinc lozenges may shorten the duration of colds: a systematic review. *Open Respir Med J* 2011; 5: 51-8.
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4. Hoffman HN, Phylly RL, Fleming CR. Zinc-induced copper deficiency. *Gastroenterology* 1988; 94: 508-12.
5. Prasad, A. S., Beck, F. W. J., Bao, B., Snell, D., & Fitzgerald, J. T. (2008). Duration and severity of symptoms and levels of plasma interleukin-1 receptor antagonist, soluble tumor necrosis factor receptor, and adhesion molecules in patients with common cold treated with zinc acetate. *J Infect Dis*, 197(6), 795-802.
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7. Hemilä, H. (2017). Zinc lozenges and the common cold: a meta-analysis comparing zinc acetate and zinc gluconate, and the role of zinc dosage. *JRSM open*, 8(5), 2054270417694291.
8. Singh, M., & Das, R. R. (2013). Zinc for the common cold. *Cochrane Database of Systematic Reviews*, (6).

The Australian Institute of Sport (AIS) Supplement Framework is an initiative of the Australian High Performance Sport System. The AIS acknowledges the support of members of the National Institute Network (NIN) and National Sporting Organisations (NSO) and their staff in delivering content expertise. This information is intended to help athletes, coaches and scientists make evidence-based decisions about the use of supplements and sports foods. Before engaging in supplement use, we recommend that each individual refer to the specific supplement policies of their sporting organisation, sports institute or parent body, and seek appropriate professional advice from an accredited sports dietitian ([www.sportsdietitians.com.au](http://www.sportsdietitians.com.au)).

Athletes should be aware that the use of supplements may have doping implications. Athletes are reminded that they are responsible for all substances that enter their body under the 'strict liability' rules of the World Anti-Doping Code. Some supplements are riskier than others. The Sport Integrity Australia (SIA) app is a useful resource to help mitigate the risk of inadvertent doping by helping to identify supplements that have been batch-tested. The SIA App provides a list of more than 11,000 batch-tested products. We recommend that all athletes consult the educational resources of SIA regarding the risks associated with supplements and sports foods.. While batch-tested products have the lowest risk of a product containing prohibited substances, they cannot offer you a guarantee that they are not contaminated ([www.sportintegrity.gov.au/what-we-do/supplements-sport](http://www.sportintegrity.gov.au/what-we-do/supplements-sport)).

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