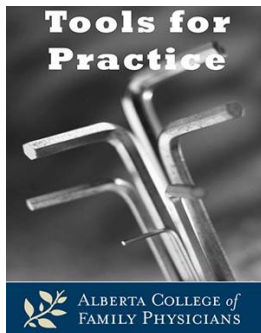


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Vitamin D and Respiratory Tract Infections: Does the sun's vitamin chase the cold?

Clinical Question: Can regular vitamin D supplementation reduce the frequency, duration, or severity of respiratory tract infection (RTI)?

Bottom-line: Regular use of vitamin D does not reduce the frequency, duration, or severity of RTI in western populations. Infrequent benefits seen in a few studies are at high risk of bias and/or involved children with profound deficiency (example 17.5 nmol/L) in developing countries.

Evidence:

- Three systematic reviews¹⁻³ with 4-11 Randomized Controlled Trials (RCTs) with 1,668-5,660 patients. Vitamin D supplementation:
 - Statistically significantly reduced RTI in two meta-analyses [Odds Ratio 0.64 (0.49-0.84)¹ and 0.58 (0.42-0.81)²] but not another [Relative Risk 0.98 (0.93-1.03)].³
 - Why the difference? Numerous large biases, especially the former two: Using odds ratios for common problems exaggerates effects, including selectively reported outcomes, combining unrelated studies, including secondary analyses, inconsistent results, and publication bias.^{1,2}
 - Examining individual RCTs:
 - Any RTI:
 - 162 US adults: No difference.⁴
 - 164 Finnish military recruits: No difference.⁵
 - 140 Immuno-compromised patients: Improved non-validated RTI score (not clinically interpretable).⁶
 - 247 Mongolian children with profound vitamin D deficiency (level=17.5 nmol/L): 0.35 less RTI over three months.⁷
 - Cold and Flu (mostly cold):
 - 322 New Zealander adults: No effect in any outcome.⁸
 - This is the highest quality study.
 - Flu:
 - 430 Japanese children mean age 10: No difference.⁹
 - Pneumonia:

- 453 Afghanistan children age <3 years: Reduced risk of one repeat pneumonia but not multiple pneumonias.¹⁰
- 3,060 Afghanistan children age <1 year: No difference (suggesting earlier results spurious).¹¹
- Three RCTs of other conditions looked at RTI secondarily:
 - Two found no difference,^{12,13} but the weakest (smallest RCT with grossly under-reported RTI examined retrospectively) found possible reduced cold/flu frequency.¹⁴

Context:

- Cohort studies suggest patients with low vitamin D levels get more RTI.¹⁵
 - However, low vitamin D status is associated with many ills from weight gain to mortality but vitamin D RCTs rarely find clinical improvements.^{16,17}
 - Vitamin D is likely a surrogate marker for ill health.¹⁶
- Cold prevention likely lies with physical interventions like hand-washing.¹⁸

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Disclosure:

Authors do not have any conflicts to disclose.

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