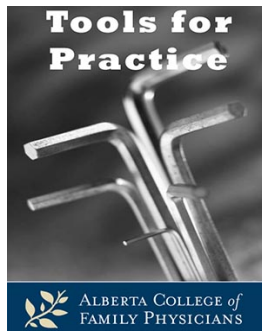


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Vitamin D Levels: Vitamin Do or Vitamin Don't

Clinical Question: In adults, what is the evidence to test serum vitamin D levels?

Bottom Line: Routine testing of vitamin D levels is unnecessary. Laboratories often report serum levels between 50 and 75–80 nmol/L as insufficient but this is not supported by consistent or reliable evidence. Additionally, large variability in the test limits interpretation of repeat measurements.

Evidence:

- Target serum level:
 - An extensive systematic review¹ on serum 25-hydroxyvitamin D (25-OHD) suggests levels:
 - >75 nmol/L “are not consistently associated with increased benefit.”
 - Above 50 nmol/L are “practically sufficient for all persons.”
 - Between 30–50 nmol/L “places some, but not all, persons at risk for inadequacy.”
 - <30 nmol/L places one “at risk relative to bone health.”
- No randomized controlled trials in falls or fractures have investigated treating specific vitamin D level targets.
- Proportion of population with various levels:
 - Levels <75–80 nmol/L for Canada, USA, and UK are 97%, 77%, and 87%, respectively.²⁻⁴ These are not necessarily concerning based on above systematic review.
 - Canadian results of potentially concerning levels showed 61% are <50 nmol/L² and 13% below 40 nmol/L.¹

Context:

- While levels ≤ 74 nmol/L are considered “insufficient” by some provincial laboratories,⁵ this is not supported by the evidence.
- Every 800 IU of vitamin D increases 25-OHD by 8–16 nmol/L; however, the dose-response relationship is not directly linear and is affected by many factors such as season, adiposity, and skin pigmentation.^{1,6}

- Vitamin D assays have a coefficient of variation that may be as high as 10–20%,¹ meaning changes in levels with doses of 800 IU/day may not be discernable due to variability in the test.
- TOP guidelines suggest supplementing without testing and exceptions where testing may be helpful are also provided in these guidelines.⁷
- Mega doses of vitamin D (i.e. 150,000 IU every three months) have been associated with increased adverse events, including falls and fractures.^{8,9}
- Enrolment in many vitamin D supplementation trials was not based on vitamin D levels and treating on speculation was beneficial.¹⁰⁻¹²
- Vitamin D doses in most trials were not adjusted based on vitamin D levels.¹³⁻¹⁹
- A 25-OHD assay costs \$61.32.²⁰

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