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Optimal serum 25-hydroxy-vitamin D

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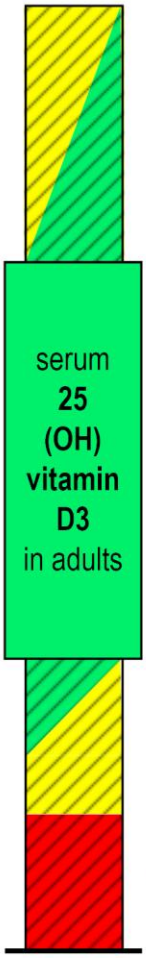

Pharmacologic dosing (eg, cancer, multiple sclerosis): 200–300 ng/mL (500–750 nmol/L)
Requires professional supervision, diet modification, laboratory surveillance per Charoenngam and Holick, *Nutrients* 2020 Jul

Potentially toxic if accompanied by clinical hypercalcemia: > 150 ng/mL (325 nmol/L)
per Grant and Holick, *Altern Med Rev* 2005 Jun

Supraphysiologic: > 100 ng/mL (250 nmol/L)
Higher levels of 25-hydroxy-cholecalciferol are clinically problematic if accompanied by hypercalcemia, calcinosis or urolithogenic hypercalciuria (especially with alkaline urine). Levels above 90-100 ng/mL (225-250 nmol/L) are generally supraphysiologic, but not inherently problematic.

Optimal physiologic range: 50-90 ng/mL (125-225 nmol/L)
Clinical example: prevention/treatment of SAS-2 coronavirus per "Participants were randomised to receive daily 60 000 IU of [Vit D3]... cholecalciferol supplementation was continued for those with 25(OH)D <50 ng/ml..." per Rastogi et al. *Postgrad Med J* 2020 Nov
Populations in sunny climates (Grant and Holick, *Altern Med Rev* 2005 Jun): pregnant rural Africans 58 ng/mL (147 nmol/L) per Luxwolda, *Eur J Nutr* 2013 Apr; USA or Israel lifeguards 59-65 ng/mL (148-163 nmol/L), farmers in Puerto Rico 90 ng/mL (225 nmol/L) per Vieth, *Am J Clin Nutr* 1999 May
Review: Clinical importance of vitamin D: paradigm shift with implications for all healthcare providers. *Altern Therap Health Med* 2004 Sep
Context: Supplemented Paleo-Mediterranean Diet. *Nutritional Perspectives* 2011 Jan academia.edu/39751813

Sufficiency (more health, less depression): 40-50 ng/mL (100-125 nmol/L)
Clinical example: enhanced well-being at 40g/ml, reduced use of antidepressant drugs per Bergman et al, *BMC Res Notes* 2015 Sep
Populations: nonpregnant rural Africans 46 ng/mL (115 nmol/L) per Luxwolda et al, *Eur J Nutr* 2013 Apr

Marginal sufficiency, increased mortality: < 30-40 ng/mL (75-100 nmol/L)
Garland et al, *Am J Public Health* 2014 Aug

Insufficiency (increased PTH, respiratory infections, ARDS): < 32 ng/mL (80 nmol/L)
Requires 114 mcg/d (4600 IU/d), per Heaney et al, *Am J Clin Nutr* 2003 Jan

Depletion (osteomalacia, chronic pain, weakness, infections): < 20 ng/mL (50 nmol/L)
Persistent, nonspecific musculoskeletal pain per Plotnikoff and Quigley, *Mayo Clin Proc* 2003 Dec

Interpretation of serum 25-hydroxy-cholecalciferol levels in adults: Interpretation of any laboratory variable requires clinical contextualization; assessing renal function and measuring 1,25-dihydroxy-cholecalciferol prior to the initiation of vitamin D3 supplementation is reasonable, especially in patients with higher probability of renal insufficiency or granulomatous/malignant/inflammatory disease, respectively. Coadministration of calcium-sparing drugs (e.g., thiazides) warrants caution; periodic measurement of serum calcium is advised, especially during the first year of higher-dose vitamin D supplementation. Supplementation with cholecalciferol should generally be accompanied by adequate magnesium intake and/or supplementation with magnesium 600 mg/d for adults; vitamins K1 and K2 should also be utilized to optimize calcium metabolism. Dietary optimization, moderation of sodium intake, broad-spectrum nutritional supplementation, and avoidance of diet-induced metabolic acidosis are likewise important; see citations listed below for proper implementation. Treatment should be supervised by a knowledgeable clinician.

Citations included in image; see also:

1. Vasquez et al. The clinical importance of vitamin D (cholecalciferol): a paradigm shift with implications for all healthcare providers. *Alternative Therapies in Health and Medicine* 2004 Sep academia.edu/40429791/
2. Vasquez A. *Textbook of Clinical Nutrition and Functional Medicine*. ICHNFM.ORG, 2016
3. Vasquez A. How to Plan Studies Using Vitamin D. *Int J Hum Nutr Funct Med* 2017 academia.edu/31412957
4. Vasquez A. Revisiting the Supplemented Paleo-Mediterranean Diet. *Nutritional Perspectives* 2011 Jan academia.edu/39751813
5. Videos/excerpts 2020, articles and correspondence compilation 2004-2019. InflammationMastery.com/d