

Vitamin D

Clinical Management in Primary Care

Purpose

This clinical guideline is to ensure that patients from a refugee background receive appropriate screening and treatment for vitamin D deficiency

1.1 Definitions

Term	Definition
25-OHD	25-hydroxyvitamin D

1.2 High risk groups

The following people are at high risk of vitamin D deficiency:

- a. Dark-skinned people, especially
 - Migrants
 - Modestly-dressed
- b. Older/ disabled people
- c. Chronic disease/ disability
- d. Obesity: obesity can lead to lower levels of vitamin D and reduced dose-response to oral vitamin D and UV.
- e. Those working in enclosed environments

It may be appropriate to supplement these people without initial screening, however, it is advised that all refugee patients have their vitamin D level measured when initial pathology tests are requested.

Screening blood test for 25-OHD should be performed by a reputable laboratory participating in the Vitamin D External Quality Assessment Scheme (DEQAS) proficiency program.

1.3 Target range

The optimal range of vitamin D required for musculoskeletal health is believed to be 50-62.5nmol/L. However, as sunlight levels (and therefore UV radiation) is lower during winter, the target ranges are defined seasonally as follows:

- a. At end of winter: ≥ 50 nmol/L
- b. At end of summer: ≥ 60 -70nmol/L

It should be noted that 25-OHD testing is vulnerable to imprecision, especially at lower range < 50 nmol/L. Therefore, caution should be exercised when interpreting results in clinical practice.

1.4 Vitamin D status

Vitamin D deficiency is defined as follows:

- a. **Mild:** 30-49nmol/L
- b. **Moderate:** 12.5-29nmol/L
- c. **Severe:** <12.5nmol/L

1.5 Treatment with supplementation

There is no difference in observed 25-OHD values whether supplements are given daily, weekly or monthly. Intermittent dosing may be more convenient and may achieve better long-term compliance. Most oral vitamin D supplements available in Australia are vitamin D3. It is not known whether this is more or less effective than supplementation with vitamin D2.

Annual megadose vitamin D is not recommended due to the risk of toxicity.

1.5.1 Moderate-severe deficiency in adults

- a. 3000-5000IU/ day for 6-12 weeks, then ongoing treatment with 1000-2000IU/day and adequate calcium intake
- b. 50,000IU vitamin D3 tablet, once per month for 3-6 months

Patients should have vitamin D levels rechecked after 3 months.

Most patients will need ongoing treatment with a lower dose (e.g. 1000IU/day)

1.5.2 Pregnant women

- a. 25-OHD levels <50 - 30nmol/L: 1000IU/day
- b. 25-OHD levels \leq 29nmol/L: 2000IU/day

Women should have vitamin D levels rechecked at 28 weeks gestation. If they have corrected to >50nmol/L, they should be given a minimum of 600IU/day for the rest of their pregnancy (1000IU/day may be more practical).

1.5.3 Breastfeeding mothers

- a. 25-OHD levels <50nmol/L: 2000IU/day

1.5.4 Term infants <3 months old

- a. 25-OHD levels <50 - 30nmol/L: 400IU/day for 3 months
- b. 25-OHD levels \leq 29nmol/L: 1000IU/day for 3 months
- c. If levels have reached \geq 50nmol/L when rechecked at 3 months, commence on maintenance of 400IU/day

1.5.5 Babies 3-12 months old

- a. 25-OHD levels <50 - 30nmol/L: 400IU/day for 3 months
- b. 25-OHD levels \leq 29nmol/L: 1000IU/day for 3 months **OR** 50,000IU stat and review after 1 month (consider repeating dose)
- c. If levels have reached \geq 50nmol/L when rechecked at 3 months, commence on maintenance of 400IU/day

1.5.6 Children 1-18 years old

- a. 25-OHD levels $<50 - 30\text{nmol/L}$: 1000-2000IU/day for 3 months **OR** 50,000IU stat
- b. 25-OHD levels $\leq 29\text{nmol/L}$: 1000-2000IU/day for 6 months **OR** 3000-4000IU/day for 3 months **OR** 50,000IU/day stat and repeat 6 weeks later.
- c. If levels have reached $\geq 50\text{nmol/L}$ when rechecked at 3 months, commence on maintenance of 400IU/day **OR** 150,000IU stat at start of autumn.

1.6 Diet

It is recommended that patients are given information regarding dietary sources of vitamin D, but they should be advised that dietary sources alone are likely to be inadequate to meet the recommended daily intake, especially in those with existing deficiency.

The estimated dietary intake for adults in Australia is 80-120IU, thus for most people, vitamin D intake via dietary sources is likely to be inadequate to meet requirements.

Small quantities of vitamin D are found in a few foods such as wild-caught fatty fish (salmon, herring, mackerel).

Very small quantities of vitamin D are found in liver, eggs and fortified foods such as margarine and very low fat milk (e.g. Paul's Physical Low-Fat milk).

1.7 UV radiation

Minutes of sun exposure needed for people with moderately fair skin to achieve about one-third of a minimal erythema dose of vitamin D

Time of year and day		
	December-January, 10:00 or 14:00	July-August, 12:00
Brisbane	6-7 minutes	11 minutes

Patients should be provided with information regarding safe sun exposure. Sun Smart Australia produces a range of patient information leaflets about vitamin D and safe sun exposure in a range of community languages: <http://www.sunsmart.com.au/tools/other-languages>

1.8 MBS Item number 66833 guidelines for Pathologists

25-hydroxyvitamin D, quantification in serum, for the investigation of a patient who:

- (a) has signs or symptoms of osteoporosis or osteomalacia; or
- (b) has increased alkaline phosphatase and otherwise normal liver function tests; or
- (c) has hyperparathyroidism, hypo- or hypercalcaemia, or hypophosphataemia; or
- (d) is suffering from malabsorption (for example, because the patient has cystic fibrosis, short bowel syndrome, inflammatory bowel disease or untreated coeliac disease, or has had bariatric surgery); or

- (e) has deeply pigmented skin, or chronic and severe lack of sun exposure for cultural, medical, occupational or residential reasons; or
- (f) is taking medication known to decrease 25OH-D levels (for example, anticonvulsants); or
- (g) has chronic renal failure or is a renal transplant recipient; or
- (h) is less than 16 years of age and has signs or symptoms of rickets; or
- (i) is an infant whose mother has established vitamin D deficiency; or
- (j) is a exclusively breastfed baby and has at least one other risk factor mentioned in a paragraph in this item; or
- (k) has a sibling who is less than 16 years of age and has vitamin D deficiency

References

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| 1 | Nowson CA, McGrath JJ, Ebeling PR, et al. (2012). Vitamin D and health in adults in Australia and New Zealand: a position statement. <i>Med J Aust</i> , 196(11): 686-687. |
| 2 | Paxton GA, Teale GR, Nowson CA, et al. (2013). Vitamin D and health in pregnancy, infants, children and adolescents in Australia and New Zealand: a position statement. <i>Med J Aust</i> , 198(3): 142-143. |
| 3 | Nichols PD, Glencross B, Petrie, JR, & Singh, SP. (2014). Readily available sources of long-chain omega-3 oils: is farmed Australian seafood a better source of the good oil than wild-caught seafood?. <i>Nutrients</i> , 6(3): 1063-1079. |