

Treatment of Vitamin D Deficiency in Adults

Aims

- Advice on the diagnosis and management of vitamin D deficiency in adults and choice of supplements
- Clinical and cost effective investigation of suspected vitamin D deficiency
- An appropriate balance between patient lifestyle, self-management and medical treatment

Background

- Vitamin D deficiency and insufficiency is a common problem worldwide, >50% of the adult population have levels classed as insufficient and 16% have severe deficiency
- The awareness that vitamin D deficiency may contribute to the development of osteoporosis and to falls and fractures has resulted in a dramatic increase in requests for serum 25 hydroxy vitamin D (25OHD) tests
- In line with NOGG Guidance, high dose vit D supplements should be prescribed for treatment of high risk adults with proven deficiency or those about to be initiated on potent anti-resorptive medication (e.g. zoledronic acid, denosumab)

Lifestyle Measures – ALL PATIENTS SHOULD BE GIVEN THIS ADVICE

People at high risk of vitamin D deficiency should be advised to supplement their vitamin D levels by:

- Increasing UV exposure on forearms, hands, or lower legs from April to October, with sun safety advice. More info at: [NHS Vitamin D](#)
- Increasing dietary vitamin D with foods containing or fortified with vitamin D: oily fish, egg yolks, cod liver oil, fresh meat, cereals and some dairy products. Or supplementation with **over the counter** (OTC) low strength vitamin D products.
- Increasing the dietary intake of vitamin D alone will not avoid the need for supplementation in patients with deficiency
- If a patient is prescribed a vitamin D supplement consideration should be given as to whether the patient has enough calcium in their diet. Calcium calculators can help clinicians to do this. See link in further information box below.
- If patients with osteoporosis or bone disease are found to not consume at least 700mg of calcium/day then a calcium supplement or combined vitamin D plus calcium product should be prescribed.
- A Reference Nutrient Intake (RNI) of 400 IU/daily (10 micrograms daily) vitamin D, throughout the year, for everyone in the general UK population aged four years and above is recommended (OTC).

High Risk Groups for deficiency – follow lifestyle advice: **NO NEED TO ROUTINELY TEST IF ASYMPTOMATIC***

- All pregnant and breastfeeding women, especially teenagers and young women are particularly at risk
- Patients under 4 (as per [NICE PH56](#)) or aged 65 years and over
- Patients with limited sun exposure (e.g. due to cultural clothing, being housebound, or in long-term care)
- Ethnic minorities who have darker skin, because their bodies are less able to produce vitamin D
- Obese people (BMI>30)
- Medical risk factors such as renal and hepatic disease, malabsorption
- Other risk factors such as alcoholics, vegetarians or vegans
- Medication - patients taking rifampicin, anticonvulsants or Highly Active Antiretroviral Treatment (HAART)

When should I test for vitamin D deficiency? **NO NEED TO ROUTINELY TEST IF ASYMPTOMATIC***

- Patients with bone diseases that may be improved with vitamin D treatment or where correcting vitamin D deficiency prior to specific treatment would be appropriate
- Where abnormalities on laboratory investigations are suggestive of vitamin D deficiency e.g. low calcium, low phosphate, isolated or raised ALP or raised PTH
- Musculoskeletal symptoms that could be attributed to vitamin D deficiency or who have symptoms of osteomalacia (proximal myopathy or chronic pain)
- Routine vitamin D testing may be unnecessary in patients with osteoporosis or fragility fracture, who may be co-prescribed vitamin D supplementation with an oral antiresorptive treatment
- Routine monitoring of serum vitamin D is generally unnecessary but may be appropriate in patients with symptomatic vitamin D deficiency, malabsorption and other conditions associated with vitamin D deficiency, and where poor compliance is suspected

* Baseline level may be required by secondary care referrals, e.g. bariatric or rheumatology

When and to whom should I refer?

- eGFR<30ml/min; renal stones; hyper or severe hypocalcaemia; hyperparathyroidism; sarcoidosis, lymphoma, metastatic cancer; active tuberculosis; skeletal deformity, malabsorption e.g. coeliac disease; chronic liver disease, patients who fail to respond to treatment or where symptoms worsen on treatment. Refer to the appropriate specialist.
- These conditions are those where calcium level may be (i) adversely affected by treatment or (ii) absorption or (iii) conversion of vitamin D to 25 (OH)D vitamin D is affected therefore referral is required

Further information Healthy Start Scheme www.healthystart.nhs.uk Full Guideline | [NOGG](#) (Updated Dec 2024)

Dietary Calcium Calculator [CGEM Calcium Calculator](#) NHSE OTC guidance: [NHS England » Policy guidance: conditions for which over the counter items should not be routinely prescribed in primary care](#) (Updated Sept 2024) NICE: Vitamin D: increasing supplement use among at-risk groups Nov 2014 PH Guidance 56 http://www.nice.org.uk/guidance/PH56_PresQIP_Vitamin_D_Bulletin_275_December_2020

thresholds and minor refresh March 2021, April 2025, July 25

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Primary Care Treatment Options (Traffic Light Status GREEN) – PRESCRIBE BY BRAND NAME*

*For use in acute trusts please liaise with the pharmacy department to confirm which brands are currently available

SERUM 25(OH)D			
<25nmol/L	25-50nmol/L	>50nmol/L	>250nmol/L
DEFICIENCY TREATMENT RECOMMENDED (target for replacement ~300,000iu)	INSUFFICIENCY May be inadequate in some people (target for replacement ~150,000iu)	IS SUFFICIENT	POTENTIALLY TOXIC
For DEFICIENT patients treat as below with loading dosage.	For INSUFFICIENT patients treatment is recommended in high risk patients & those with previous fragility fracture /osteoporosis. In certain situations (see SPC) higher doses of up to 50,000 IU/month or up to 4,000 IU/day may be required short-term if pts cannot be maintained at the lower doses.	Provide reassurance and give lifestyle advice (see overleaf) on increasing vitamin D intake	Daily doses in excess of 250micrograms or 10 000 units are generally required to achieve this. Provided basic investigations are undertaken before treatment & renal disease, liver disease, primary hyperparathyroidism and inflammatory conditions have been excluded, then vitamin D toxicity is very rare. Early symptoms of toxicity include symptoms of hypercalcaemia such as thirst, polyuria and constipation
LOADING DOSES: Prescribe colecalciferol as one of the following: InVita D3 oral solution 25,000 IU / ml (1ml amps): Dose 50,000 IU/week (2 ampoules) for 6 weeks (adults with swallowing difficulties) OR Stexerol D3 25,000IU tablets , TWO tablets (50,000IU) per week for 6 weeks NOTE: Both products suitable for vegetarians/halal/kosher but not for vegans.			
CAUTION: If corrected calcium ≥ 2.5 when vit D low, Primary Hyperparathyroidism (PHPT) should be considered. Discuss with endocrinology (For RUH: Consultant Connect or bleep 7059) before starting vit D replacement			
Maintenance Therapy: Encourage patients to buy themselves OTC			
For those with documented vitamin D deficiency and where the underlying cause for this cannot be rectified, on-going maintenance therapy is advisable. FP10 options are: Invita D3 oral solution 25,000 units / ml (1ml amps): 25,000IU once a month. Certain populations are at high risk of vitamin D deficiency, and may require higher doses and monitoring of serum 25(OH)D. See Summary of Product Characteristics for full details. OR Stexerol D3 tablets 25,000 units ONE tablet each month OR if patient unlikely to adhere to a monthly preparation: Stexerol D3 tablets 1,000IU ONE tablet each day. Note that a daily tablet is more expensive than a monthly one (roughly double the cost). For patients that are at high risk of vitamin D deficiency, lifestyle advice should be given. If this cannot be adhered to, an on-going maintenance dose should be considered.			
Self Care / Purchase 800-2000iu colecalciferol daily can be purchased e.g. from Boots, Holland and Barrett, healthspan.co.uk and lifestylenaturalhealth.co.uk. Monthly cost range £1.50 to £5 OR Prescribe oral vitamin D supplementation as above (+/- calcium).			
PRODUCT INFORMATION			
Stexerol film-coated tablets are suitable for vegetarians, certified halal & kosher, peanut oil free, soya oil free, gelatine free, & gluten free. The tablets can be crushed or swallowed whole and can be taken with food. The vitamin D is derived from sheep’s wool so they may not be suitable for vegans but they are suitable for vegetarians. FREE TEXT Compliance Service - Patients may choose to opt into this service to receive reminders to take their Stexerol D3, see the PIL for further information. A monthly dose also helps to reduce pill burden as the patient will only require 12 tablets for a year. Summary of product characteristics for Stexerol: http://www.medicines.org.uk/emc/medicine/31223 Summary of product characteristics for Invita D3: https://mhraproducts4853.blob.core.windows.net/docs/c6daff6cc3ce3711665caf264e72cfb8fa697246 See also Choosing calcium and vitamin D products for vegetarians or vegans – SPS - Specialist Pharmacy Service – The first stop for professional medicines advice (Updated February 2025)			

Monitoring

- Check serum calcium 2 weeks after initiating treatment in patients with a corrected calcium >2.5 pre-treatment or known PHPT and monitor 2 weekly if rising significantly (discuss with endocrinology if necessary)
 - Check after 1 month or end of course, if applicable
- If symptoms persist, re-test serum 25(OH)D after at least 3–6 months.

General Points

- Patients on bisphosphonates or antiresorptives should take calcium (1–1.3g) with colecalciferol (800–2000 IU daily), unless dietary intake is adequate and vitamin D is sufficient.
- **Conversion factors:** 10micrograms = 400units vitamin D

Pregnancy and Breast Feeding

- The Department of Health recommends that all pregnant and breastfeeding women should take 10µg (400IU) of oral vitamin D daily to prevent vitamin D deficiency
- Available as Healthy Start (91p for 56 tablets) or free to eligible women under the Healthy Start scheme: www.healthystart.nhs.uk. A suitable alternative to buy OTC is Pregnacare (£13.23 for 90 tabs)
- Refer pregnant women in whom vitamin D deficiency is suspected to specialist for investigation & management
- Breast milk from mothers on high-dose vitamin D may cause infant hypercalcaemia; monitoring is needed. Breastfed infants may need vitamin D drops from one month if maternal supplementation was lacking during pregnancy.