

Treatment of Vitamin D Deficiency in Adults

Aims

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

Background

- Vitamin D deficiency and insufficiency is a common problem worldwide
- More than 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 hydroxyvitamin D (25OHD) tests
- In line with NOS 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-resorptives (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 sunlight exposure (face and forearms) between 9am and 3pm for 30 minutes twice a week from April to October (double the exposure for heavily pigmented skin). Sun safety advice should be given. Further advice is available at: <http://www.nhs.uk/Livewell/Summerhealth/Pages/vitamin-D-sunlight.aspx>
- 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 low strength vitamin D products.
- Increasing the dietary intake of vitamin D alone will not avoid the need for supplementation in patients with vitamin D 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.

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 5 or aged 65 years and over
- Patients not exposed to much sun, for example those who cover their skin for cultural reasons, who are housebound or confined indoors for long periods
- 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? (Cost approximately £20 per test)

NOTE : GPs are unable to order vitamin D tests at GWH. Discuss any cases with consultant chemical pathologist.

- 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

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

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

SERUM 25(OH)D			
<30nmol/L	30-50nmol/L	>50nmol/L	>250nmol/L
DEFICIENCY	INSUFFICIENCY	IS SUFFICIENT	POTENTIALLY TOXIC
TREATMENT RECOMMENDED (target for replacement ~300,000 units)	May be inadequate in some people (target for replacement ~150,000 units)		
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. Use loading dosage below.	Provide reassurance and give lifestyle advice (see overleaf) on increasing vitamin D intake	Daily doses in excess of 250micrograms or 10000 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
<p>LOADING DOSES: Prescribe colecalciferol as one of the following: InVita D3 oral solution 25,000 Units / ml (1ml amps):Dose 50,000 units/week (2 ampoules) for 6 weeks (adults with swallowing difficulties) OR Stexerol D3 25,000 units tablets, TWO tablets (50,000 units) per week for 6 weeks →then follow maintenance therapy advice below</p>			
<p>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</p>			
<p>Maintenance Therapy: Encourage patients to buy themselves OTC</p>			
<p>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): 25,000 units 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 1,000 units 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.</p>			
<p>Self Care / Purchase 800-2000 units 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).</p>			
<p>PRODUCT INFORMATION</p>			
<p>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.</p> <p>FREE TEXT Compliance Service - Patients can opt into this, see the PIL for further information. To help remind them to take their Stexerol D3. A monthly dose also helps to reduce pill burden as the patient will only require 12 tablets for a year.</p> <p>Summary of product characteristics for Stexerol: http://www.medicines.org.uk/emc/medicine/31223 Summary of product characteristics for Invita D3: http://www.medicines.org.uk/emc/medicine/28998 See also https://www.sps.nhs.uk/articles/is-there-a-calcium-and-vitamin-d-preparation-which-is-suitable-for-a-vegetarian-or-vegan/</p>			

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 in all other pts

General Points

- All patients taking bisphosphonates or antiresorptive drugs should be taking regular calcium supplements (1-1.3g calcium plus colecalciferol 800 -2000 units daily) unless the clinician is confident dietary calcium is adequate & vitamin D is replete.
- See Lifestyle section overleaf for further information
- **Conversion factors:** 10micrograms = 400units vitamin D

Pregnancy and Breast Feeding

- The Department of Health recommends that all pregnant and breastfeeding women should take 10µg (400 units) of 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 of women taking pharmacological doses of vitamin D can cause hypercalcaemia if given to an infant and additional monitoring is required. Breast fed infants *may* need to receive drops containing vitamin D from one month if their mother has not taken vitamin D supplements throughout pregnancy

Further information Healthy Start Scheme www.healthystart.nhs.uk National Osteoporosis Society vitamin D and bone health. A practical guideline for patient management. <http://www.cgem.ed.ac.uk/research/rheumatological/calcium-calculator>
 Dietary Calcium Calculator <http://www.sign.ac.uk/guidelines/fulltext/71/annex4.html>
 NICE: Vitamin D: increasing supplement use among at-risk groups Nov 2014 PH Guidance 56 <http://www.nice.org.uk/guidance/PH56>