

**WORCESTERSHIRE COUNTY AREA PRESCRIBING COMMITTEE**
**Guidelines for the Treatment of Vitamin D Deficiency and Inadequacy in Adults**
**Recommendations:**

The [National Osteoporosis Society \(NOS\) guidance 'Vitamin D and Bone Health: A Practical Clinical Guideline for Patient Management'](#)<sup>1</sup> should be followed.

**Vitamin D3 (colecalciferol) preparations should be prescribed for treatment of deficiency or inadequacy (in certain situations – see table below).**

**For maintenance treatment patients should be advised to purchase a vitamin D supplement.** (Except patients with osteoporosis, osteopenia, hyperparathyroidism, a history of hypercalcemia or receiving parenteral osteoporosis treatment in whom, if indicated, continued prescribing is appropriate).

**Key recommendations from NOS guidance:**
**What should be measured?**

Measurement of (total) plasma 25OHD (25-hydroxy vitamin D, calcidiol, calcifediol) is the best way of estimating vitamin D status. (In Worcestershire, routine analysis of total vitamin D is in-house by immunoassay. If the patient is on D2 (ergocalciferol) samples are sent to the referral lab in South Manchester for analysis by mass-spectrometry). If 25-OH vitamin D2 and 25-OH vitamin D3 are reported separately these values need to be added together to calculate total serum 25OHD and decision to treat made on combined level not individual D2 and D3 levels.

**Who should be tested?**

Plasma 25OHD measurement is recommended for:

- Patients with diseases with outcomes that may be improved with vitamin D treatment e.g. confirmed osteomalacia.
- Patients with symptoms that could be attributed to vitamin D deficiency e.g. suspected osteomalacia, chronic widespread pain with other features of osteomalacia.
- Before starting patients on a potent antiresorptive agent (zoledronate or denosumab or teriparatide).

**Who should NOT be routinely tested?**

- Asymptomatic individuals at higher risk of vitamin D deficiency. Department of Health Guidance [VITAMIN D - ADVICE ON SUPPLEMENTS FOR AT RISK GROUPS](#) <sup>(2)</sup> should be followed regarding appropriate treatment options. **(Note – the supply of vitamin D preparations via prescription is not the preferred route of provision for the majority of these individuals – see Department of Health Guidance via link above).**
- Asymptomatic healthy individuals.
- In most cases routine vitamin D testing is unnecessary in patients with osteoporosis or fragility fracture, who may be co-prescribed vitamin D supplementation with an oral antiresorptive treatment (e.g. alendronic acid).

**Vitamin D levels, status and treatment recommendations (Table 1).**

Total serum 25OHD level	Status	Who should be treated
<25 nmol/L	Deficiency	All patients
25-50 nmol/L	Inadequacy (in some people)	<b>ONLY</b> if one or more of the following applies: <ul style="list-style-type: none"> <li>• Fragility fracture/osteoporosis/ high fracture risk</li> <li>• Drug treatment for bone disease</li> <li>• Symptoms suggestive of vitamin D deficiency</li> <li>• Increased risk of developing vitamin D deficiency e.g. <ul style="list-style-type: none"> <li>○ Reduced UV exposure (religious/cultural dress code, dark skin etc.)</li> <li>○ Raised PTH</li> <li>○ Treatment with anticonvulsants or glucocorticoids</li> <li>○ Malabsorption</li> </ul> </li> </ul>
>50 nmol/L	Sufficiency (for almost the whole population)	No treatment required; provide reassurance and give advice on maintaining adequate vitamin D through safe sunlight exposure and diet.

**Treatment**

- Oral vitamin D3 (colecalciferol) is the treatment of choice.
- Where **rapid correction** of vitamin D deficiency is required, such as patients with symptomatic disease or about to start treatment with a potent antiresorptive agent (e.g. denosumab), the recommended regimen is based on **fixed loading doses followed by regular maintenance therapy**:
  - **Loading regimen** – total of approximately 300,000 units colecalciferol, given as either weekly or daily doses over 6 to 10 weeks.
  - **Maintenance therapy** – 800 to 2,000 units (occasionally up to 4,000) units colecalciferol daily, OR intermittently at higher doses.
- **Where correction of vitamin D deficiency is less urgent** and when co-prescribing with oral antiresorptive agents such as alendronic acid, **maintenance therapy may be started without the use of loading doses.**
- **Maintenance therapy should only be prescribed for patients listed below, other patients should be advised to buy an over the counter preparation.**
  - With osteoporosis or osteopenia (as calcium and vitamin D or vitamin D alone)
  - With hyperparathyroidism
  - With a history of hypercalcaemia (as if indicated, close monitoring is required).
  - Receiving parenteral osteoporosis treatment.
- Adjusted serum calcium should be checked one month after completing the loading regimen and considered after starting vitamin D supplementation, in case primary hyperparathyroidism has been unmasked.
- Routine monitoring of plasma 25OHD is generally unnecessary but may be appropriate in patients with symptomatic vitamin D deficiency or malabsorption and where poor compliance with medication is suspected.

**Example regimes and formulary preparations**

See appendix 1

**References:**

- (1) Vitamin D and Bone Health: A Practical Clinical Guideline for Patient Management. National Osteoporosis Society December 2018. [The National Osteoporosis Society \(NOS\) guidance 'Vitamin D and Bone Health: A Practical Clinical Guideline for Patient Management'](#)
- (2) Vitamin D – Advice on supplements for at risk groups. Department of Health 2<sup>nd</sup> February 2012 [VITAMIN D - ADVICE ON SUPPLEMENTS FOR AT RISK GROUPS](#)
- (3) Which vitamin D preparations are suitable for a vegetarian or vegan diet? UKMi Q&A 8<sup>th</sup> August 2017 [Which vitamin D preparations are suitable for a vegetarian or vegan diet?](#)

**Appendix 1: Example regimes and formulary preparations**

	Dose	Example regimes	Formulary preparations
<b>Loading</b>	Colecalciferol up to a total of approximately 300,000 units given as weekly or daily split doses	Colecalciferol: <ul style="list-style-type: none"> <li>50,000 units once a week for 6 weeks</li> <li>40,000 units once a week for 7 weeks</li> <li>800 unit tablets / capsules five daily for 10 weeks</li> </ul>	<ul style="list-style-type: none"> <li>Invita D3<sup>®</sup> 50,000 unit capsules</li> <li>Invita D3<sup>®</sup> 25,000 units/ 1ml oral solution (2ml oral ampoules)</li> <li>Plenachol<sup>®</sup> 40,000 unit capsules</li> <li>Desunin<sup>®</sup> 800 unit tablets</li> </ul>
<b>Maintenance</b> (Only for patients with osteoporosis, osteopenia, hyperparathyroidism, history of hypercalcaemia or receiving parenteral osteoporosis treatment).	Colecalciferol 800 to 2,000 units daily (occasionally up to 4,000 units daily), given daily or intermittently at a higher equivalent dose	Colecalciferol only preparations: <ul style="list-style-type: none"> <li>40,000 unit capsules, one once a month</li> <li>20,000 unit capsules, two once a month</li> <li>800 unit capsules, one daily</li> <li>800 unit tablets, one daily</li> <li>25,000 units/ 1ml oral solution, 1ml once a month</li> </ul>	<ul style="list-style-type: none"> <li>Plenachol<sup>®</sup> 40,000 unit capsules</li> <li>Fultium -D3<sup>®</sup> 20,000 unit capsules</li> <li>Fultium-D3<sup>®</sup> 800 unit capsules</li> <li>Desunin<sup>®</sup> 800 unit tablets</li> <li>Invita D3<sup>®</sup> 25,000 units/ 1ml oral solution, 1 oral ampoule (1ml) once a month</li> </ul>
		Preparations providing 800 -1000 units colecalciferol and 1000 - 1200mg calcium / day	<ul style="list-style-type: none"> <li>CALCI-D<sup>®</sup> chewable tablets one daily</li> <li>Adcal-D3<sup>®</sup> chewable tablets one twice a day/ two daily</li> <li>Adcal-D3<sup>®</sup> caplets two twice a day</li> <li>Adcal-D3<sup>®</sup> dissolve one twice a day/ two daily</li> </ul>
<b>Maintenance</b> (Other patients)	Colecalciferol 800 to 2,000 units daily	<p><b>Advise patient to purchase an over the counter preparation.</b></p> <p><b>Note</b> preparations containing 1000 units (25 micrograms) are considerably cheaper to purchase than those containing 400 (10 micrograms) or 800 units (20 micrograms).</p>	

Please refer to manufacturer's information for detailed prescribing information for each product INCLUDING ADVICE ABOUT PATIENTS WITH RENAL IMPAIRMENT, available via <http://www.medicines.org.uk/emc/>

N.B. A licensed injection of ergocalciferol 300,000 units is also available, however it is not recommended by NOS. <sup>(1)</sup>

For information about which products are suitable for a vegetarians and vegans see: [Which vitamin D preparations are suitable for a vegetarian or vegan diet?](#) <sup>(3)</sup>