Vitamin D Management in Adults (including Pregnancy / Breastfeeding)

Guidelines on the prevention, diagnosis, and management of Vitamin D deficiency in primary care

Version 1

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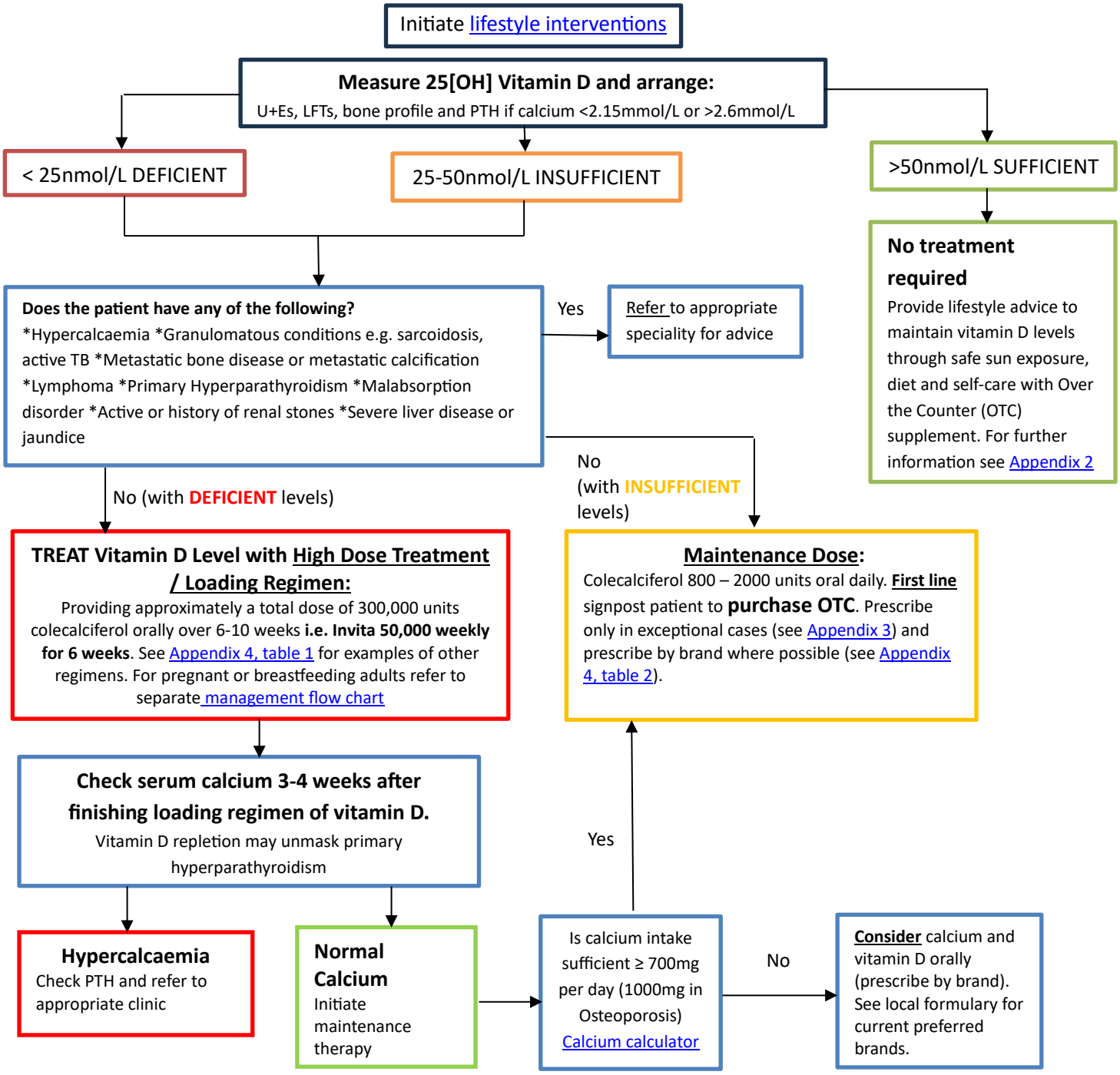
Approved by: SY IMOC
Approval Date: May 2025
Review Date: May 2028

Management Flow Chart: Vitamin D in *Non-Pregnant* Adults

NICE CKS recommends NOT routinely testing for vitamin D deficiency in people who are asymptomatic. Check Vitamin D level by measuring serum 25-hydroxyvitamin D (25[OH]D) if a person has:

- Clinical features and symptoms of deficiency (see Appendix 1, Box 1)
- Suspected or diagnosed bone disease i.e. osteoporosis, Paget's Disease.
- Planned administration of potent antiresorptive therapy (e.g. zoledronate, denosumab, teriparatide)
- A clinical reason e.g. a metabolic factor

This advice also applies to patients with risk factors for developing vit D deficiency (see Appendix 1, Table 1) and patients receiving oral antiresorptive therapy if co-administered with maintenance vitamin D.



When are repeat levels of Vitamin D indicated?

Routine monitoring of serum vitamin D levels is not needed. Repeat levels can be considered in 3-6 months for those:
*With malabsorption *If concerns still symptomatic *Risks of poor compliance *Prescribed antiresorptive therapy and / or those who have extremely low levels of vitamin D at baseline *Prescribed anticonvulsant medicines *Active bone disease * Those with increased fracture risk such as recurrent falls * Severe liver / renal disease

Management Flow Chart: Vitamin Supplementation in *Pregnancy / Breastfeeding*

All pregnant and breastfeeding women should be advised to take;

- 10 micrograms (400 units) **Vitamin D** daily ideally before conception, **throughout** pregnancy and whilst breastfeeding. Women who may require testing for deficiency should be identified as a higher dose may be needed.
- 400 micrograms **Folic Acid** daily before conception (ideally 3 months) and until week 12 of pregnancy. Women at *higher risk of conceiving a child with a neural tube defect should be identified and advised to take Folic Acid 5mg daily (**prescription only**) and continue until week 12 of pregnancy. (See pink box below)

All advice given should be recorded and compliance checked at each antenatal appointment

Healthy Start Vitamins for Women

- Contain 400 micrograms of Folic Acid, 10 micrograms of Vitamin D and 70 milligrams of Vitamin C. It is a cost effective option of obtaining Folic acid and Vitamin D and can be purchased from Family Hubs. Women requiring a higher dose of Vitamin D or Folic Acid should be signposted to their GP.
- Certain women are eligible for free vitamins via the national scheme (which entitles them to other items e.g. milk, fresh fruit and veg).
- Advice given should be recorded in the woman's records.

Folic Acid - Women at *higher risk of conceiving a child with a neural tube defect;

- Either partner has a neural tube defect (or a family history) or previous pregnancy affected by a neural tube defect
- BMI ≥ 30kg/m^{2} - pre-pregnancy
- Those with Diabetes Mellitus
- Those taking Antiepileptic medicines.
- Those with sickle-cell disease or thalassemia (these groups should take 5mg Folic acid throughout pregnancy)

Women with a history of confirmed Vitamin D deficiency

Is the woman currently taking a Vitamin D supplement?

Yes → Check that dose and preparation is suitable

No → Measure Vitamin D and bone profile (request via ICE)

Women at increased risk of Vitamin D deficiency

Does the woman have symptoms or have additional risk factors for Vitamin D deficiency?

Yes → Measure Vitamin D and bone profile (request via ICE)

No → Recommend **Healthy Start Vitamins for Women.** *Stress importance of compliance as this group at greater risk of deficiency*

25(OH)D <25 nmol/L *(Deficient)* – refer to 'Pregnant Women: High dose Oral Vitamin D Supplementation and Monitoring'

25(OH)D >25 and <50 nmol/L *(Insufficient)* – See 'Enhanced supplement' box below

25(OH)D >50 nmol/L *(Sufficient)* - Recommend Healthy Start Vitamins for Women or if previous history of deficiency see 'Enhanced supplement' box below.

Enhanced supplement (800 – 1000 units) options for women at risk of D deficiency (pre-pregnancy) and for maintenance after high dose treatment;

If calcium intake is sufficient (pregnant: 700mg / day, breastfeeding: 1250mg / day)

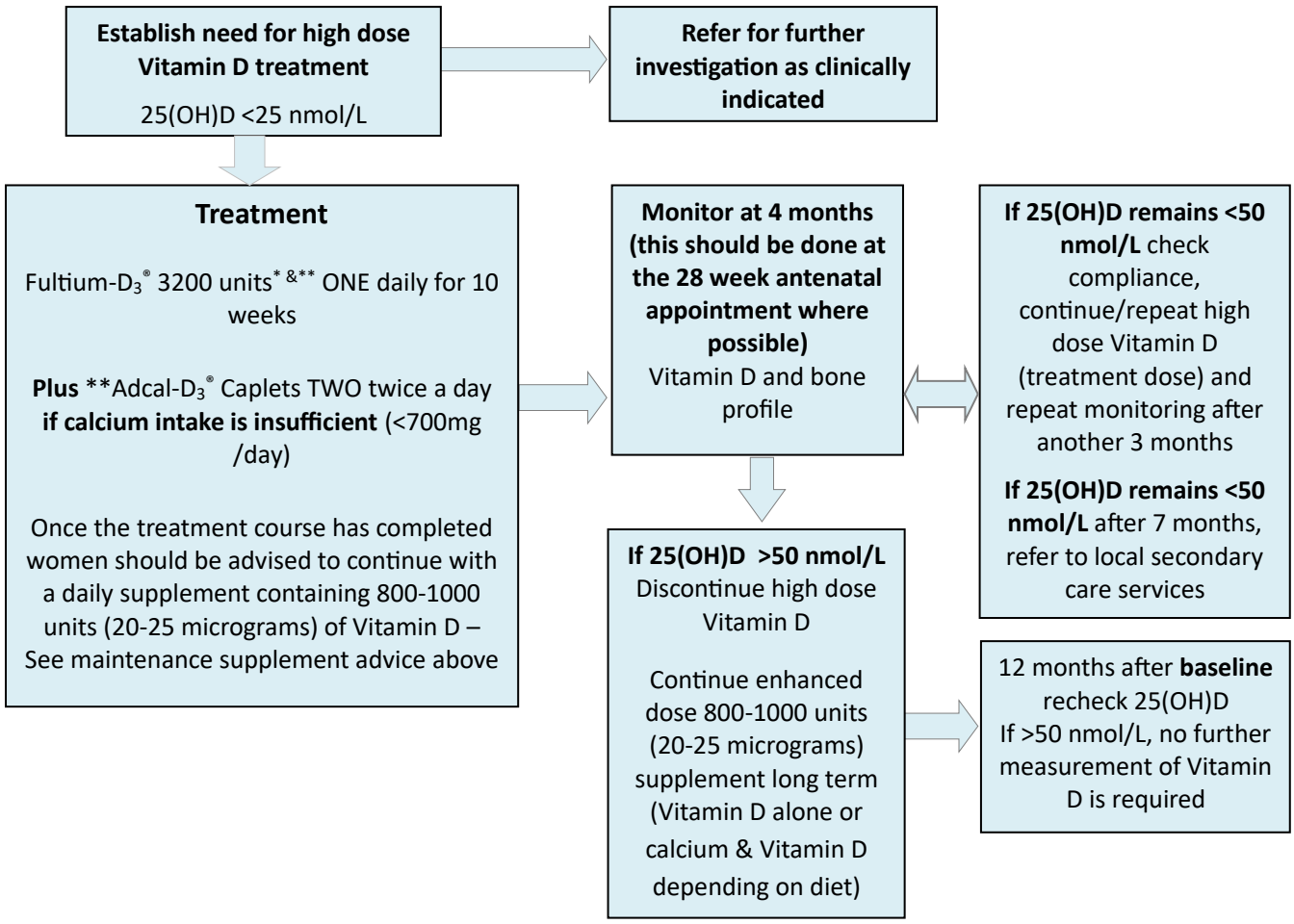
- Healthy Start Vitamins for Women - ONE daily **plus** a daily dose of 10-15 micrograms (400-600units) Vitamin D. Encourage OTC or prescribe as *InVita® D_3 2,400 units/ml drops (POM) 6 drops = 400 units
- A daily colecalciferol preparation containing 20-25 micrograms (800-1000 units). Encourage OTC or prescribe *Fultium-D_3® 800 units capsules (POM) (plus Folic Acid as above).

If calcium intake is insufficient:

- A daily combination preparation containing recommended amounts. Encourage OTC or prescribe *Adcal-D_3® caplets (recommended dose is 2 BD providing 1200mg calcium + 800 units Vitamin D) (plus Folic Acid as above)

**Licensed preparations for use in pregnancy*

Pregnant Women: High-dose Oral Vitamin D Supplementation and Monitoring



* Halal or kosher certified.
** Licensed preparation for use in pregnancy

Breastfeeding Women: High-dose Oral Vitamin D Supplementation

With regards to prescribing in breastfeeding mothers, SPS have also provided the following advice, further information around this can be found here:

- Long term maintenance doses (up to 4000 units daily) can be used without any infant monitoring.
- Loading doses are acceptable during breastfeeding with infant monitoring as a precaution.
- Infant monitoring may be required in the following situations:
    - hypercalcaemia is suspected due to infant symptoms
    - loading doses above 300,000 units are used (which may include treatment course for longer than 10 weeks)
    - loading doses totalling 300,000 are given in in less than 6 weeks.

Appendix 1: Clinical features of Vitamin D deficiency and risk factors

Box 1: Clinical features and risk factors of vitamin D deficiency and osteomalacia

- Gradual onset and persistent bone pain without preceding mechanical injury (frequently in back, ribs, or lower limbs).
- Fragility fracture.
- Proximal muscle weakness (difficulty with stairs, getting up off the floor or standing after sitting in a low chair, waddling gait) or muscle pain.
- Carpopedal spasm, tetany, seizures, or irritability due to hypocalcaemia and requiring urgent treatment.
- Osteopenia on plain radiograph.
- Low bone density on dual energy x ray absorptiometry scan (does not equate to osteoporosis).

Table 1: Risk factors for vitamin D deficiency

Vitamin D levels can be checked whenever relevant as part of clinical judgement, however factors increasing risk of vitamin D deficiency are:

Inadequate UVB light exposure	Inadequate dietary intake or absorption	Metabolic factors
• Pigmented skin, for example, people of African, African–Caribbean and South Asian origin • Lack of sunlight exposure or atmospheric pollution • Routine covering of face or body or routine use of sunscreen • Housebound or indoor living (i.e. care home residents) • Seasonal (or living in areas where exposed to less sun)	• Pregnancy & breastfeeding • Infants & young children • Cystic Fibrosis • Inflammatory bowel disease • Malabsorption (i.e. coeliac disease, Crohn's disease) • Short bowel, bowel surgery • Cholestatic liver disease, jaundice • Bariatric surgery	• People aged 65yrs and above (due to reduced synthesis in the skin) • Drug interactions e.g. rifampicin, anticonvulsants (carbamazepine, oxcarbazepine, phenobarbital, phenytoin, primidone, valproate), isoniazid, cholestyramine, sucralfate, glucocorticoids, highly active antiretroviral treatment (HAART) • Chronic liver disease • Chronic renal disease • Patients with BMI over 30kg/m^2

Appendix 2: Patient information about Vitamin D and lifestyle advice

Link to local printable Patient information leaflets

Advice on lifestyle measures to maintain and prevent low vitamin D levels consist of:

- safe sun exposure
- self-supplementation
- dietary advice

Advice on safe sun exposure:
From late March or early April to the end of September, most people should be able to get all the vitamin D they need from sunlight. The body creates vitamin D from direct sunlight on the skin when outdoors. Between October and early March however, not enough vitamin D is created from the sunlight, and it may be difficult to get the recommended daily intake from diet alone. More information about sun exposure and vitamin D is available on the Royal Osteoporosis Society website

Advice on supplementation of vitamin D:
To prevent vitamin D deficiency, the Department of Health and Social Care recommend taking a daily supplement containing 10 micrograms* (400 units) of vitamin D during autumn and winter when there is limited sun exposure. All year-round supplements should be considered for people aged 65 and over, with history of vitamin D deficiency, or who have very little or no sunshine exposure e.g. housebound, in a residential home, usually wearing clothes that cover up most of the skin. Patients should be advised to purchase vitamin D supplements over the counter.

*Note that, often, supplements containing 25 micrograms (1000 units) are considerably cheaper to buy than those containing 10 micrograms (400 units) or 20 micrograms (800 units). This is a suitable dose to take daily as supplement to prevent vitamin D deficiency.

Advice on dietary sources of vitamin D:
Vitamin D is also found in a small number of foods including:

- egg yolks
- fortified foods – such as most fat spreads, soy yogurts, soy milk, almond milk, some orange juices and some breakfast cereal
- liver
- mushrooms
- oily fish – such as salmon, sardines, herring and mackerel
- fresh or canned tuna
- red meat
- ricotta cheese.

In the UK, dairy products from cows' milk are not routinely fortified, so are not regarded as good sources of vitamin D but are great dietary sources of calcium.

More information for patients is available on the following websites:

- NHS Website – Vitamin D
- Osteoporosis: Nutrition for bones (theros.org.uk)
- Vitamin D: welcome to the 'sunlight zone' (theros.org.uk)
- Royal College Obstetrics and Gynaecologists: Healthy eating and vitamin supplements in pregnancy
- The Association of UK Dieticians

Appendix 3: Exceptions to self-care for maintenance vitamin D on NHS prescription

After a vitamin D treatment course has been completed, **the majority of people will be advised to purchase a maintenance dose over the counter**. Prescriptions for vitamin D should be reserved for the treatment of patients with confirmed deficiency that require treatment with loading doses. This is in line with NHSE policy guidance: conditions for which over the counter items should not routinely be prescribed in primary care. Note that maintenance or preventative supplementation is not an exception for vitamin D prescribing. Patients can buy vitamin D supplements at low cost at most pharmacies, supermarkets and health food stores. Patients should be counselled on the importance of maintenance treatment **following** high dose treatment / loading regimen. For advice on pregnancy and breastfeeding women see separate flow chart. There are some exceptions to self-care are listed below this; patients should be reviewed on a case-by-case basis.

Example of general exceptions where prescribing may be considered:	
Active bone disease	e.g. (osteomalacia, osteopenia, osteoporosis, Rickets, renal osteodystrophy, Paget's disease of the bone, fragility fracture history)
Hyperparathyroidism	
Care homes or if housebound	
Renal impairment	
Pregnancy	
If taking any of the following medication:	• anti-convulsant medications • rifampicin • digoxin* (see interaction guidance below) • anti-resorptive medicines • steroids i.e. prednisolone • isoniazid • cholestyramine • sucralfate • highly active anti-retroviral treatment (HAART) * If taking digoxin - monitor calcium levels one month after the last vitamin D loading dose and then every 3-6 months. The patient should also be advised to report any signs of digoxin toxicity such as bradycardia, nausea, and vomiting. Consider an ECG and digoxin level if toxicity is suspected.
Malabsorption risks	Coeliac, Crohn's, Cystic Fibrosis, or under dietetics for other malabsorption indication. **Bariatric patients encouraged to purchase OTC**
Compliance concerns	Those with frequent instances of deficiency

Appendix 4: Vitamin D preparations available for prescribing in line with this guideline

- Full treatment course to be prescribed by brand name and issued as an acute prescription rather than added to a repeat prescription. Prescribing by brand ensures a licensed product is dispensed by the pharmacy.
- To help absorption, vitamin D should be taken with food
- All products listed below are licensed in the UK.
- *Please note, this is a primary care guideline, and should a patient be commenced on treatment in hospital the selection of preparation may change in line with local trust formulary*.

Table 1: Recommended vitamin D preparations for correction of vitamin D level with high dose treatment / loading regimen

Brand Prescribe by brand name		Treatment dose & course length	Gelatin free?	Suitable in Peanut / Soya allergy?	Suitable for vegetarians? **	Halal	Kosher
Solid dose formulation	**1st line:** InVita D3® 50,000 unit capsules	1 x 50,000 units per week for 6 weeks	✗	✓	✗	✓	✓
	2nd line: Stexerol D3® 25000unit tablets *(reserved for those with dietary requirements)*	2 x 25,000 units per week for 6 weeks	✓	✓	✓	✓	✓
Liquid	InVita D3® 50,000 units / 1mL oral solution 'snap & squeeze'*	1 x 50,000 units per week for 6 weeks	✓	✓	✓	✓	✓
*InVita D3® comes as a "Snap and squeeze" ampoule. Take at mealtimes.  If preferred, the contents can be emptied onto a spoon or mixed with a little cold or lukewarm food immediately before use. See SPC for further information							

** There is currently no licensed oral vitamin D preparation available that would be suitable for a vegan diet. There are a variety of unlicensed vitamin D supplements derived from plant based sources available OTC, please see the Specialist Pharmacist Service (SPS) document *"Which vitamin D preparations are suitable for a vegetarian or vegan diet?".*

Table 2: Vitamin D preparations for maintenance dosing

Products listed below are only to be prescribed if the patient meets the exception criteria listed in appendix 3. All other patients should be advised to purchase a vitamin D supplement which will provide 800 to 2000units per day (click here for patient information leaflet).

Brand Prescribe by brand name		Dose	Gelatin free?	Suitable in Peanut / Soya allergy?	Suitable for vegetarians?	Halal	Kosher
Daily preparations							
Solid dose formulation	**1st line:** Invita D3® 800unit capsules	ONE daily	✗	✓	✗	✓	✓
	2nd line: Stexerol D3® 1000unit tablets *(reserved for those with dietary requirements)*	ONE daily	✓	✓	✓	✓	✓
Liquid	Invita D3® 2400 units / mL oral drops* (Note: 1ml contains 36 drops) *Licensed in pregnancy / breastfeeding, infants and children	6 drops provides 400 units	✓	✓	✓	✓	✓
Monthly preparations: *maintenance dosing 25000unit per month (averages 890units per day) (if preferred for compliance):*							
1st line: Invita D3® 25000unit capsules		ONE monthly	✗	✓	✗	✓	✓
2nd line: Stexerol D3® 25000unit tablets *(reserved for those with dietary requirements)*		ONE monthly	✓	✓	✓	✓	✓

References

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Nottinghamshire vitamin D guidelines: [accessed October 2024]

Nottinghamshire Vitamin D patient leaflet: [accessed October 2024]

Vegan Society: Vitamin D [accessed October 2024]

Specialist Pharmacy Service: Choosing an oral vitamin D preparation for vegetarians / vegans [accessed October 2024]

NICE CKS: Management of vitamin D deficiency or insufficiency [accessed October 2024]

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With acknowledgement and sincere thanks to Nottinghamshire ICB for sharing their guidance for adaptation.