

Vitamin D Management in Adults

EXCLUSIONS: patients with chronic kidney disease (**stages 3b, 4, and 5**), h/o renal stones, hypercalcaemia, sarcoidosis, liver disease, TB, lymphoma, metastatic cancer, parathyroid disorders, atypical biochemistry (persistent hypophosphatemia, elevated creatinine) – **seek specialist advice**

ROUTINE TESTING is generally NOT recommended unless one of the following applies:

- Patients with **PERSISTENT SYMPTOMS** that could be attributed to vitamin D deficiency e.g. symptoms of osteomalacia, such as bone discomfort or pain (often throbbing) in lower back, pelvis, and lower extremities; impaired physical function; muscle aches and weakness (may be marked, usually most noticeable in the quadriceps and glutei, and can result in difficulty in rising from a seating position, or a waddling gait); symmetric lower back pain; chronic widespread pain
- Patients with diseases with outcomes that may be improved with vitamin D treatment e.g. confirmed osteomalacia, osteoporosis. (*People with osteoporosis who are treated with vitamin D supplements and an oral antiresorptive agent do not need routine testing*)
- Patients being started on a potent antiresorptive agent (zoledronate or denosumab or teriparatide)

NO

No prescribed treatment required

Maintain vitamin D through safe sun exposure and diet / supplement use (OTC colecalciferol 400units daily). More info in [appendix 2](#)

YES

Test 25-hydroxyvitamin D (25[OH]D) (Also measure: U+Es, LFTs, and bone profile)
PTH should be checked if calcium < 2.15 mmol / L or > 2.6mmol / L
Vitamin D will naturally be lower October-March due to seasonal variation

< 25 nmol / L

25 – 50 nmol / L

> 50 nmol / L

Does one or more of following apply?

- **Persistent symptoms** suggestive of vitamin D deficiency ([appendix 1](#))
- About to start treatment with a potent antiresorptive agent (zoledronate, denosumab, or teriparatide)

YES

YES

Consider loading regimen

- (Approximately 300,000 units colecalciferol orally over 6 – 12 weeks) – see table 2 in [appendix 4](#) e.g. (prescribe by brand)
- **InVita D3 50,000 unit capsules** – Take one capsule once a week for 6 weeks **OR**
 - **InVita D3 50,000 unit / 1mL oral solution** – Take the contents of one ampoule by mouth once a week for 6 weeks **OR**
 - **Stexerol-D3 25,000 unit tablets** – Take two tablets once a week for 6 weeks **OR**
 - **Fultium-D3 3,200 unit capsules** – Take one capsule once a day for 12 weeks

Check serum calcium 3 – 4 weeks after finishing loading regimen of vitamin D
Vitamin D repletion may unmask primary hyperparathyroidism

Does one or more of the following apply?

- Fragility fracture / osteoporosis / high fracture risk
- Medicine treatment for bone disease
- Symptoms suggestive of vitamin D deficiency ([appendix 1](#))
- Increased risk of developing vitamin D deficiency e.g. reduced UV exposure, raised PTH, treatment with anticonvulsants or glucocorticoids, malabsorption

NO

NO

No prescribed treatment required

Maintain vitamin D through safe sun exposure and diet / supplement use (OTC colecalciferol 400units daily). More info in [appendix 2](#)

Routine replacement / maintenance therapy

OTC colecalciferol 800 – 2000 units orally daily. Prescribe only in exceptional cases ([appendix 3](#) for detail).
Note that currently 1000 unit (25 microgram) TABLETS are most cost effective.

Check if calcium intake sufficient (≥ 700 mg per day)? [Calcium calculator](#)
Provide lifestyle advice if not

Routine repeat vitamin D testing is not required, but reinforce concordance at routine reviews

Following loading regimen, if still symptomatic at 3 months retest vitamin D and review diagnosis.

Patients with malabsorption conditions may require repeat testing. Review of on-going treatment will be dependent on the patient's symptoms, risks and lifestyle.

Calcium normal: Recommend maintenance therapy (OTC) / lifestyle advice

Hypercalcaemia: Check PTH and refer to appropriate clinic

Appendix 1: Risk factors, features and treatment of insufficiency and deficiency

Table 1: Risk factors for vitamin D deficiency

Inadequate UVB light exposure	Inadequate dietary intake or absorption	Metabolic factors
<ul style="list-style-type: none"> • Pigmented skin (non-white ethnicity) • Lack of sunlight exposure or atmospheric pollution • Skin concealing garments or routine use of sun protection factor 15 or above • Housebound or indoor living (e.g. care homes) • Seasonal 	<ul style="list-style-type: none"> • Vegetarian (or other fish-free diet) • Malabsorption (e.g. coeliac disease, Crohn's disease, pancreatic enzyme insufficiency etc.) • Short bowel • Cholestatic liver disease, jaundice 	<ul style="list-style-type: none"> • Older people aged 65 years and over (reduced synthesis in the skin) • Drug interactions e.g. rifampicin, anticonvulsants (carbamazepine, oxcarbazepine, phenobarbital, phenytoin, primidone and valproate), isoniazid, cholestyramine, sucralfate, glucocorticoids, highly active antiretroviral treatment (HAART) • Chronic liver disease • Chronic renal disease • Obesity (body mass index greater than 30 kg/m²) – vitamin D may be sequestered into adipose tissue reducing bioavailability • Pregnant or breastfeeding women – due to the risk of foetal neonatal hypovitaminosis

Symptoms of vitamin D deficiency and osteomalacia

- Bone discomfort or pain (often throbbing) in lower back, pelvis, and lower extremities
- Impaired physical function
- Muscle aches and weakness (may be marked, usually most noticeable in the quadriceps and glutei, and can result in difficulty in rising from a seating position, or a waddling gait)
- Symmetric lower back pain
- Chronic widespread pain
- Fragility fracture

Treatment of insufficiency and deficiency is advised in patients with the following:

Loading regimen / rapid correction:

- Treatment with antiresorptive medication for bone disease
- Symptoms suggestive of vitamin D deficiency

Routine replacement / maintenance therapy (800 – 2000 units daily):

The patient should obtain this OTC. Only prescribe in exceptional circumstances.

- Fragility fracture, documented osteoporosis or high fracture risk
- Increased risk of developing vitamin D deficiency in the future because of reduced exposure to sunlight, religious / cultural dress code, dark skin, etc.
- Raised PTH
- Medication with antiepileptic medicines or oral glucocorticoids
- Conditions associated with malabsorption

Appendix 2: Patient information about vitamin D and lifestyle advice

For lifestyle advice see the patient information leaflet at the end of this guidance.

More information for patients is available on the following websites:

- [NHS Website – Vitamin D](#)
- [Royal Osteoporosis Society: Nutrition for bones](#)
- [Royal College Obstetrics and Gynaecologists: Healthy eating and vitamin supplements in pregnancy](#)
- [BDA food fact sheet on Vitamin D](#)

Appendix 3: Vitamin D products available without prescription

Patients should buy vitamin D supplements unless they meet one of the specific vitamin D exception criteria in the NHS England guideline: [Conditions for which over the counter items should not routinely be prescribed in primary care](#) (on pg. 17).

Note that maintenance or preventative treatment is not an exception for vitamin D prescribing. Exceptions to self-care are also listed in the [BMA Over-the-counter medicines guidance](#).

Prescriptions for vitamin D should be reserved for the treatment of patients with symptoms of deficiency, confirmed deficient vitamin D levels that require **treatment** with loading doses or those patients who are about to start treatment with zoledronate or denosumab. **Subsequent maintenance doses should then be purchased over the counter.**

Patients can buy vitamin D supplements at most pharmacies and supermarkets for less than £5 for a three month supply. Women and children who qualify for the Healthy Start scheme can get free supplements containing the recommended amounts of vitamin D. The [NHS website](#) provides additional information for patients.

Products available over the counter are suitable for replacement / maintenance doses as well as for prophylaxis in winter if required.

Pregnant and breastfeeding women

NICE recommend that all pregnant and breastfeeding women should be informed about the importance of vitamin D and should take 10 micrograms (400 units) daily. Supplements are available to purchase over the counter or via the Healthy Start programme if the patient is eligible (see below).

High risk women (women with increased skin pigmentation, reduced exposure to sunlight, or those who are socially excluded or obese) may be advised to take at least 1000 units (25 micrograms) daily. [SPS](#) also has some helpful guidance.

REMEMBER – pregnant women should avoid taking multivitamins containing vitamin A (retinol) due to the teratogenic risk of vitamin A.

Healthy Start vitamins

Healthy Start vitamins (www.healthystart.nhs.uk) for women and children are free of charge for low income families and are available from Sure Start centres and [some other health centres](#). You can also ask your midwife or health visitor for where they are available locally.

For those people in whom Healthy Start vitamins are not suitable, a range of vitamin D3 supplements are available for purchase over the counter.

Appendix 4: Vitamin D preparations available for prescribing (when treating in accordance with this guideline)

Table 2: Recommended vitamin D preparations for loading regimen

All products listed are licensed in the UK. InVita D3 is currently the most cost effective product.

Brand Prescribe by brand name	Pack size	Treatment dose and course length	Gelatin free?	Suitable in peanut / soya allergy?	Suitable for vegetarians?***	Notes
InVita D3 50,000 unit capsules	3	1 x 50,000 units per week for 6 weeks	N	Y	N	Not licensed for under 18 years
InVita D3 50,000 units / 1mL snap & squeeze amps*	3	1 x 50,000 units per week for 6 weeks	Y	Y	Y	Not licensed for under 18 years
Stexerol-D3 25,000 unit tablets	12	2 x 25,000 units per week for 6 weeks	Y	Y	Y	Not licensed for under 12 years
Fultium-D3 3,200 unit capsules	90	1 x 3,200 units per day for 12 weeks	N	Y	N	Gelatin in Fultium-D3® suitable for Kosher and Halal diet

*InVita D3® comes as a “Snap and squeeze” ampoule (see below). Patients should be advised to take InVita D3® at mealtimes – If preferred, the contents can be emptied onto a spoon and taken orally or mixed with a little cold or lukewarm food immediately before use. See [SPC](#) for further information. This information can be found in the [Patient Information Leaflet](#).



** There is currently no licensed oral vitamin D3 preparation available that would be suitable for a vegan diet. There are unlicensed products available that may be suitable, please see the Specialist Pharmacist Service (SPS) document “[Which vitamin D preparations are suitable for a vegetarian or vegan diet?](#)” for more information.

See [table 3](#) overleaf for routine replacement therapy

Table 3: Routine replacement / maintenance therapy (as per NHSE / BMA exception criteria)

Products listed below are only to be prescribed if the patient meets the relevant self-care exception criteria (see [appendix 3](#)). All other patients should be advised to **purchase** a vitamin D supplement which will provide 800 to 2000 units per day.

Oral Vitamin D preparation Prescribe by brand name	Examples	Allergy / dietary info. For info on peanut / soya allergy – see SPS document “ Vitamin D: Is there a licensed product suitable for a patient with peanut or soya allergy? ”
Colecalciferol 1000 unit tablets Currently the most cost effective	Stexerol-D3	Colecalciferol is derived from healthy live sheep’s wool fat – may be acceptable to vegetarians*. Stexerol-D3 does not contain gelatin
Colecalciferol 800 unit capsules Various brands – see BNF	Fultium-D3	The gelatin used in the Fultium-D3 capsule shell is certified to Halal and Kosher standards (see website)
Colecalciferol 800 unit tablets Various brands – see BNF	Desunin	Desunin does not contain gelatin. Colecalciferol is derived from healthy live sheep’s wool fat – may be acceptable to vegetarians*.
Colecalciferol 2,740 units / mL oral drops sugar free	Fultium-D3 drops 12 drops (800 units)	Does not contain gelatin. Suitable for a vegetarian* diet.

* There is currently no licensed oral vitamin D3 preparation available that would be suitable for a vegan diet. There are products without a licence available that may be suitable, please see the Specialist Pharmacist Service document “[Which vitamin D preparations are suitable for a vegetarian or vegan diet?](#)” for more information.

High Dose Intramuscular Vitamin D (secondary care only)

A high dose vitamin D therapy given intramuscularly in a single dose

Advantages:

- Compliance is not an issue
- Faster improvement in biochemical marker (4 – 7 days), compared with daily dose (2 – 3 weeks)
- Overcome malabsorption problems

Disadvantages:

- IM injection (needle phobia issues), which cannot be given with a plastic syringe
- Variability in absorption characteristics

Colecalciferol Dose	Course length
300,000 units colecalciferol given as an intramuscular injection (unlicensed product)*	A single injection

*IM injections of colecalciferol are not approved for use in community settings, suitable patients should be referred to secondary care.

Note:

- Activated preparations of vitamin D such as alfacalcidol or calcitriol are NOT indicated for the treatment of simple vitamin D deficiency
- Combination preparations of vitamin D / calcium are not required to treat vitamin D deficiency – however it is important to assess that dietary intake of calcium is sufficient and to supplement where insufficient or where there is documented hypocalcaemia.

Further resources:

Information on available vitamin D preparations:

- BNF available at <https://bnf.nice.org.uk>
- Drug Tariff available at <https://www.nhsbsa.nhs.uk/pharmacies-gp-practices-and-appliance-contractors/drug-tariff>
- Summaries of Product Characteristics available at www.medicines.org.uk/emc

National Guidance:

- NHS England: Conditions for which over the counter items should not routinely be prescribed in primary care: Guidance for CCGs, March 2018 <https://www.england.nhs.uk/wp-content/uploads/2018/03/otc-guidance-for-ccgs.pdf>
- NICE CKS Vitamin D deficiency in adults - treatment and prevention, last revised April 2021 <https://cks.nice.org.uk/topics/vitamin-d-deficiency-in-adults/>
- NICE CG62: Antenatal care for uncomplicated pregnancies, March 2008 (updated February 2019) <https://www.nice.org.uk/guidance/cg62>
- NICE NG34: Sunlight exposure: risks and benefits, February 2016 <https://www.nice.org.uk/guidance/ng34>
- NICE PH11: Maternal and child nutrition, March 2008 (updated November 2014) <https://www.nice.org.uk/guidance/ph11>
- NICE PH56: Vitamin D: supplement use in specific population groups, November 2014 (updated August 2017) <https://www.nice.org.uk/guidance/ph56>
- NHS Vitamins, Supplements and Nutrition in Pregnancy, February 2020 <https://www.nhs.uk/pregnancy/keeping-well/vitamins-supplements-and-nutrition/>
- Vitamin D and Bone Health: A Practical Clinical Guideline for Patient Management, February 2020 <https://strwebprdmedia.blob.core.windows.net/media/ef2ideu2/ros-vitamin-d-and-bone-health-in-adults-february-2020.pdf>

SPS Medicines Q&As:

- What dose of vitamin D should be prescribed for the treatment of vitamin D deficiency? April 2020 <https://www.sps.nhs.uk/articles/what-dose-of-vitamin-d-should-be-prescribed-for-the-treatment-of-vitamin-d-deficiency-2/>
- Is there a suitable vitamin D product for a patient with a peanut or soya allergy? September 2020 <https://www.sps.nhs.uk/articles/is-there-a-suitable-vitamin-d-product-for-a-patient-with-a-peanut-or-soya-allergy/>
- Which vitamin D preparations are suitable for a vegetarian or vegan diet? December 2019 <https://www.sps.nhs.uk/articles/which-vitamin-d-preparations-are-suitable-for-a-vegetarian-or-vegan-diet/>
- Dosing and monitoring for treatment of Vitamin D deficiency in pregnancy, March 2021 <https://www.sps.nhs.uk/articles/dosing-and-monitoring-for-treatment-of-vitamin-d-deficiency-in-pregnancy/#:~:text=For%20oral%20treatment%20of%20vitamin.used%20for%204%2D6%20weeks>

Nottinghamshire APC guidance:

- [Vitamin D in Adults](#)
- [Vitamin D in Children](#)
- [Patient information leaflet](#)

Vitamin D patient information

Why do we need vitamin D?

Vitamin D is needed to keep bones, teeth and muscles healthy. If you have low levels of vitamin D you may feel tired or have aches and pains, but some people don't have any symptoms at all. If vitamin D levels fall very low (known as vitamin D deficiency) bones can become soft and weak, which can lead to deformities, especially in children and young people.



How can I increase my vitamin D levels?

Our main source of vitamin D is the action of sunlight on our skin. Small amounts of sunlight, as you might get through daily activities (e.g. 15 minutes between 11am and 3pm from April to September three times a week), may help to boost your vitamin D levels. Just exposing your face and forearms to the sun should be enough. People with dark skin, e.g. of African, African-Caribbean or south Asian origin, will need to spend longer in the sun to produce the same amount of vitamin D as someone with lighter skin.

Be careful not to burn in the sun, so take care to cover up, or protect your skin with sunscreen before your skin starts to turn red or burn.

Although sunlight is the main source of vitamin D, eating vitamin D rich food is also beneficial as part of a healthy balanced diet. Food sources which are rich in vitamin D include:

- Egg yolks
- Liver
- Red meat
- Oily fish – such as salmon, sardines, herring and mackerel
- Foods fortified with vitamins – such as margarine, some breakfast cereals and vegetarian friendly foods such as soy yogurt.



Who should take a vitamin D supplement?

Public Health England recommends that **everyone** should take a daily supplement of vitamin D during the *autumn and winter months*. **Most people get enough vitamin D from sunlight and food in spring and summer so don't need a supplement during these months.**

Some people can't get enough vitamin D from sunlight. You should take a daily supplement **all year-round** if:

- you are not often outdoors, for example if you are frail or housebound
- you live in a residential or care home*
- you usually wear clothes that cover up most of your skin when outdoors
- you have dark skin, such as those of African, African-Caribbean or South Asian origin
- you are pregnant or breastfeeding

Continued overleaf...

What dose of vitamin D should I take?

Adults and children over 5 years old:

Adults and children over 5 need 400 units (10 micrograms) a day. This includes pregnant and breastfeeding women.

If you have been identified by your healthcare professional as having a vitamin D deficiency, you may be advised to take a higher dose of vitamin D.

Babies and children up to 5 years old:

The Department of Health recommends that:

- breastfed babies from birth to 1 year should be given a daily supplement containing 340 units (8.5 micrograms) to 400 units (10 micrograms) of vitamin D
- formula-fed babies having less than 500ml (about a pint) of infant formula a day should be given a vitamin D supplement
- children aged 1 to 4 years old should be given a daily supplement containing 400 units (10 micrograms) of vitamin D

Where can I get vitamin D supplements?

Low cost vitamin D supplements can be purchased from pharmacies, most supermarkets and health food shops. Vitamin D is also known as colecalciferol. When you are choosing an over the counter vitamin D supplement look for vitamin D3 (colecalciferol) as this form of Vitamin D is best absorbed by your body.



GP practices in Sussex no longer routinely prescribe vitamin D supplements on the NHS. Patients currently receiving vitamin D on a repeat prescription **for routine replacement** will be reviewed and most prescriptions stopped. Patients taking calcium and vitamin D for a medical condition, such as osteoporosis, will continue to get prescriptions on the NHS.

If your vitamin D levels are very low, you may be prescribed a treatment course of vitamin D. Once the treatment course is completed, you will be advised to buy vitamin D supplements and take them long-term to prevent your vitamin D levels from falling again.

Daily supplements are available in a variety of strengths and products (these strengths may be shown as micrograms or units on the label), ask your community pharmacist for advice if you are unsure which vitamin D product would be best for you.



Women and children

Women and children may qualify for the Healthy Start scheme and can get free supplements containing the recommended amounts of vitamin D. More information can be obtained from <https://www.healthystart.nhs.uk/> or by asking your midwife / health visitor.

Further information

Further information on vitamin D from the NHS is available on the NHS website using the following links:

<https://www.nhs.uk/conditions/vitamins-and-minerals/vitamin-d/>

*<https://www.gov.uk/government/publications/vitamin-d-for-vulnerable-groups/vitamin-d-and-care-homes-guidance> (winter 2021)

If you would like this information in an alternative format, please contact the NHS Sussex Public Involvement team. Phone: 01903 708411