

Vitamin D in Adults

Summarised version of Barnsley Vit D guidelines for BEST June 2017

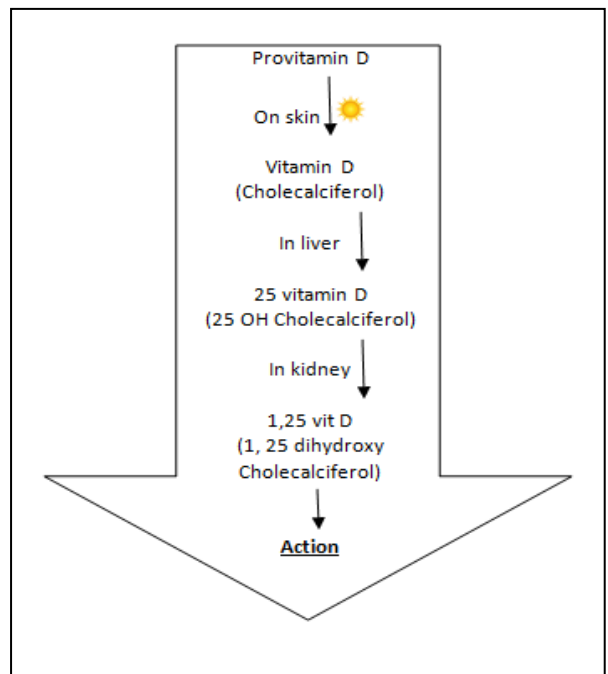
Refer to original guidelines for more detailed information
(includes Calcium and vit D formulary)

Sources of Vitamin D

Over 80% of the body's vitamin D supply -from the action of sunlight on the skin.

- Aim to spend 20 – 30 minutes outdoors at least 3 times a week between April and October , Face and arms exposed without sunscreen
- (this increases to 3-10 times for dark pigmented skin)

Diet provides at most 20 % of daily requirements - Dietary sources of vitamin D include oily fish, liver, meat, eggs, mushrooms and fortified cereal/milk. (see Vit D BDA diet sheet- BEST website)



People at risk of developing Vitamin D deficiency and those requiring higher Vit D doses

These people should be advised to take Vit D (cholecalciferol) supplement 400IU daily otc / or intermittent equivalent dose eg 28000 iU/week

- Black and ethnic minority patients with darker skin
- Routine covering of face or body or routine use of sun screen with SPF8 and above
- Vegan or vegetarian diet
- Drugs including anticonvulsants, cholestyramine, rifampicin, glucocorticoids, anti-retrovirals
- Age above 65 years / or Institutional care / or housebound / or recurrent falls -(prescribe calcium and vit D see formulary page 4)

Special cases

Pregnant and breastfeeding women

- all should receive Vit D through Healthy Start Vitamins www.healthystart.nhs.uk
- maximum dose of Colecalciferol is 4000 IU daily during pregnancy
- Suggested regime for treatment of **Vitamin D deficiency in pregnancy** would be :
 - Thorens 10,000 units/1ml (400IU=2 drops); 20 drops daily for 10 weeks (total 280,000 units) – first line

Intestinal malabsorption / Chronic liver disease – consider referral

- Vitamin D deficiency should be treated with 2-3 times higher doses of pharmacological vitamin D.
- Patient may require injectable preparation.

Renal impairment- consider referral

- patients with eGFR 35 -50 ml/min may require higher doses of Vitamin D supplementation.
- If eGFR is below 35, patient will require Alfacalcidol or Calcitriol (Specialist initiation only).

Primary hyperparathyroidism and Vitamin D deficiency

- These patients should be treated as needed and serum calcium should be monitored.

Test for vitamin D deficiency in the following patients :-

- General lethargy, muscle/skeletal aches and tenderness
- Pathological/ fragility fractures
- Osteopenia on plain radiology

where correcting vitamin D deficiency before starting osteoporosis treatment is necessary.

- low bone mineral density on DXA scan
- Bone mineral loss while on osteoporosis treatment
- treatment with a potent antiresorptive agent such as Zoledronate, Denosumab or Teriparatide

Vitamin D status - blood tests advised

serum 25OHD (25-hydroxyvitamin D).

Calcium,

Alkaline phosphatase (ALP)

Phosphate

eGFR (or Creatinine clearance).

Parathyroid hormone (PTH)

Interpretation of Vitamin D results

Vitamin D status	Treatment recommendation
Vitamin D Deficiency (< 25 nmol/L)	Treatment recommended (loading dose and maintenance dose therapy)
Vitamin D insufficiency (25-50 nmol/L)	Treatment (maintenance dose therapy ONLY) awaiting national guidance OTC purchasing Treatment is only advised in the following groups of patients: <ul style="list-style-type: none"> • At risk group of developing vitamin D deficiency • Symptoms suggestive of low vitamin D level • Fragility fracture, osteoporosis or high fracture risk • Raised PTH
Adequate Vitamin D (> 50nmol/L)	No treatment required Reassurance - Lifestyle and general advice

Pharmacological treatment - (aim to correct vit D levels >50 nmol/l)

Oral Colecalciferol (Vitamin D3) is the preparation of choice. Supplements should be taken with food to aid absorption

Vitamin D2 (ergocalciferol) injection not recommended except in GI absorption problems. Ergocalciferol injection of 300,000 IU as loading dose is given i.m. in buttock.

Clinicians should prescribe Colecalciferol preparation by brand name as prescribing generally may result in expensive specials being supplied which could cost several hundred pounds per prescription.

Adults: Loading dose = 300,000iu over 6-12 weeks - to be used in patients with symptomatic disease or patients about to start treatment with (Zolendronate/ Denosumab/ Teriparatide)

Product	Pack size	Strength	Dose	Cost of 300,000iu
Stexerol Tablets Suitable for vegetarians. Halal and Kosher certified, Nut, soya, gelatine and gluten-free.	12 tablets	25,000iu per tablet	Two tablets weekly for 6 weeks	£17.00 (12tablets)
Invita D3 liquid (snap and squeeze' plastic ampoule) Suitable for vegetarians and are gelatine, PEG and peanut oil free.	3x1ml	50,000 iu/ml	1ml once a week for 6 weeks	£12.50 (6x1ml)
Thorens Liquid (single dose bottle) Ok for vegetarians but not for vegan patients. The olive oil excipient has not been certified halal or kosher.	4x2.5ml	25,000iu/2.5ml	2.5ml twice a week for 6 weeks	£17.55 (12x2.5ml)

Adults: Maintenance dose = 800iu – 2000iu daily (1 month after loading) – given life long

Product	Pack size	Strength	Dose	Cost (per 28 days)
Stexerol Tablets Suitable for vegetarians. Halal and Kosher certified, Nut, soya, gelatine and gluten-free.	28 tablets	1000iu per tablet	One tablet daily	£2.95
Stexerol Tablets	12 tablets	25,000iu /tablet	1 -3 tablets a month	£17.00
Thorens Liquid (single dose bottle) Ok for vegetarians but not for vegan patients. The olive oil excipient has not been certified halal or kosher.	4x2.5ml	25,000iu/2.5ml	2.5ml - 7.5ml monthly	£1.46

Various other brands are available over the counter (OTC) and self-purchase should be encouraged for asymptomatic individuals in the 'At Risk group'

Treatment monitoring

Routine monitoring of serum 25OHD is unnecessary but may be appropriate required in patients with symptomatic vitamin D deficiency / or malabsorption /or poor compliance

Blood Tests required for monitoring

1. **Adjusted serum calcium: 1 month after completing loading regime**
2. **Serum Vitamin D (25OHD) at 6 months**

Vitamin D toxicity – (Vit D > 500 nmol/l) causing hypercalcaemia

- Upper limit of 4000 IU (100 mcg)
- a day equivalent) is safe for adults and children over 11 years of age.
- Vitamin D intake below 10,000 IU/day (or equivalent) is not usually associated with toxicity
- Annual depot vitamin D therapy either by intramuscular injection or orally OR Use of activated vitamin D preparations (calcitriol and alfacalcidol) have been demonstrated not to work or to have a high risk of being ineffective or causing toxicity, and are therefore not to be recommended

Indications for specialist referral

- Atypical clinical manifestations, renal stones, Hypercalcaemia
- Lack of clinical response to 2 courses of loading vitamin D therapy (exclude non-compliance)
- Chronic renal impairment (eGFR <35 ml/min)
- Secondary causes – malabsorption, liver disease, renal disease, lymphoma, metastatic cancer, Parathyroid disorders, sarcoidosis or tuberculosis.

Calcium+Vitamin D and Vitamin D Summary of formulary choices

- For at risk patients ie - Age above 65 years / or Institutional care / or housebound / or recurrent falls
- Low dietary calcium intake on osteoporosis treatment

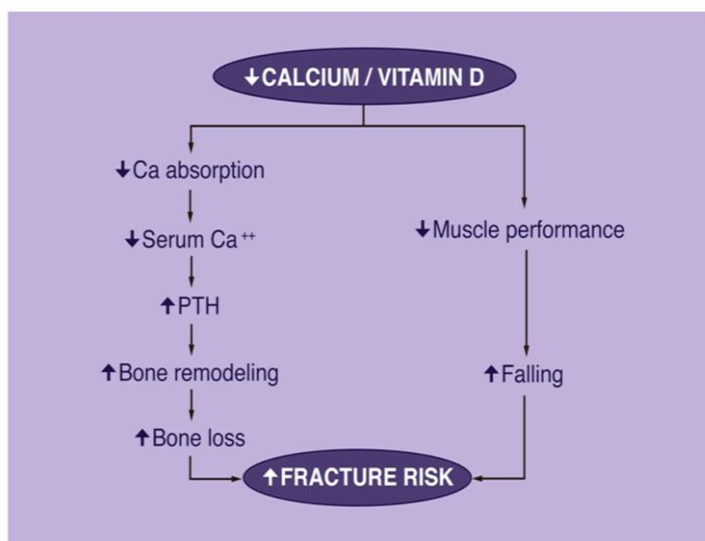
Product	Strength per tablet	Calcium equivalence	Dose	Cost (per 28 days)
First line option: For patients who are happy to have, or require, a chewable tablet or if a once daily preparation is preferred.				
Calci-D chewable tablets	2.5g + 1000iu	1g	One tablet daily	£2.25
Option: For patients who do not want, or are unable to take, a chewable tablet.				
Accrete D3 tablets	1.5g + 400iu	600mg	One tablet twice daily	£2.75
Adcal D3 caplets	750mg + 200iu	300mg	Two tablets twice daily	£2.95
Option: For patients who are unable to swallow so require a liquid preparation.				
Calfovit D3 powder in sachet for oral suspension	3.1g + 800iu	1.2g	1 sachet daily	£4.03
Option: For patients who require a reduced dose of calcium but still require the recommended dose of Vitamin D				
Kalcipos-D tablet	1.25g + 800iu	500mg	1 tab daily	£3.93
Kalcipos-D Chewable tablet	1.25g + 800iu	500mg	1 tab daily	£3.93

Summarised by Dr.Atcha May 2017 for June BEST event.

Please refer to detailed Barnsley Vitamin D guidelines for more detailed information

Dietary calcium assessment – use – IOF calcium calculator www.iofbonehealth.org

Vitamin D is required to prevent bone loss and fractures



Modified from Dawson-Hughes BoneKEy 2(12):39-41.

Calcium Sources	
Milk, all types 1/3 pint (200ml)	240mg
Cheese, hard matchbox-size (30g)	240mg
Yoghurt, plain/fruit 1 pot (150g)	240mg
Calcium- enriched soya/oat milk (200 mls)	240mg
Sardines (with bones) ½ tin (60g)	240mg
Rice pudding ½ large tin (200g)	180mg
Soya bean curd / tofu (60g)	180mg
Calcium fortified bread (180mg)	180mg
Spinach, boiled 1serving (120g)	180mg
Figs, dried, (4)	180mg
Cheese triangle (15g)	120mg
Cottage Cheese 1 pot (100g)	120mg
Custard 1 serving (120ml)	120mg
White bread 2 large slices	120mg
Fortified soya yogurt/dessert/custard (125g)	120mg
Baked beans small tin (220g)	120mg
Fromage frais 1 portion (50g)	60mg
Tinned salmon (½ tin)	60mg
Wholemeal bread (2 large slices)	60mg
Hummus 1 serving (150g)	60mg
Broccoli, boiled, 2 sprigs (85g)	60mg
Brazil nuts or Almonds (30g)	60mg
Orange (1)	60mg