Hertfordshire and West Essex Integrated Care System

NHS Hertfordshire and West Essex Integrated Care Board

For use in West Essex

Vitamin D - Adult and paediatric deficiency & insufficiency guidance

Management of Serum 25 OHD levels in ADULTS

< 30 nmol/L
Deficient

PRESCRIBE
Loading dose treatment

The **loading regime** is based on fixed loading doses of vitamin D up to a total of about 300,000 international units [IU]) given either as weekly or daily split doses. *Several* treatment regimens are available, depending on Vit.D preparations available.
Refer to page 5 for drug interactions.

ACUTE RX	Strength	Dose	Duration	Qty
1st Line:				
Hux D3 capsules (*1, *3)	20,000 units	Two capsules (40, 000 units) Once a week	7 weeks	14
2nd Line: i.e. patients with swallowing difficulties				
Thorens solution (*2, *3)	25,000 units/2.5 mL	5mL (50,000 units) Once a week (2 bottles)	6 weeks	12 bottles
3rd Line: i.e compliance concerns, covert admin, Dosette pt, breastfeeding mothers (refer to page 4)				
Desunin tablets (*2, *3)	4,000 units	One tablet Once a day	10 weeks	70

*1 Does not contain peanut oil or soya
*2 Does not contain any nut or soya derived ingredients
*3 Suitable for vegetarians
For preparations suitable for vegans refer to page 4

Followed by Lifelong maintenance treatment

30 to 50 nmol/L
Insufficient

Advise OTC Maintenance treatment*

OTC maintenance treatment* is advised in patients with;

- Fragility fracture, osteoporosis, or high fracture risk.
- Treatment with an antiresorptive drug for bone disease.
- Symptoms (refer to page 3) suggestive of vitamin D deficiency.
- Increased risk (refer to page 3) of developing vitamin D deficiency in the future
- Raised parathyroid hormone levels.
- Antiepileptic drugs or an oral corticosteroid, or is on long-term treatment with other drugs (Page 3) known to cause vitamin D deficiency, such as colestyramine.
- Malabsorption disorder (e.g. Crohn's disease, pancreatic insufficiency) or other condition (refer to page 3) known to cause vitamin D deficiency, e.g. chronic kidney disease.

Maintenance treatment of about 800 units a day **purchased OTC*** (refer to page 8).
If eligible, via the government's "Healthy Start" scheme (refer to page 8).
Higher doses of up to 1000 to 4000 units a day, may be used for certain groups of people, for example those with malabsorption disorders.

> 50 nmol/L
Sufficient for almost all adults

Advise on maintaining adequate levels to prevent deficiency

Safe sun exposure (refer to page 7)

OTC Supplementation*:
Consider 400 units (10mcg):

- For all adults especially from October until the end of March.
- Pregnant or breastfeeding mother
- People from Ethnic minority groups with dark skin
- People aged over 65years
- Anyone whose skin has little or no exposure to the sun (resident in care homes/ prisons/ shift workers)

Dietary advice: Both vitamin D and calcium (refer to page 8) are needed to prevent long-term adverse effects on the bones

If symptoms and signs have not improved despite satisfactory 25(OH)D levels, consider an alternative diagnosis(page 3).

OTC doses of Vitamin D are available to purchase in 400IU, 800IU, 1000IU, 2000IU and 4000IU.
(refer to page 8) Maintenance treatment can be prescribed if there are safeguarding concerns.

Monitoring

The aims for monitoring are to:
1. Detect those who remain deficient after loading
2. Detect those who become deficient during maintenance
3. Detect those patients in whom vitamin D therapy uncovers sub-clinical primary hyperparathyroidism.

Following High Dose treatment

Within in one month: check adjusted serum calcium levels.
Consider checking serum calcium levels more regularly in people receiving calcium supplements in addition to high-dose vitamin D treatment.

If hypercalcaemia is identified:
Assess hydration, and consider admission if dehydrated.
If the person is taking calcium supplements, advise them to stop.

If calcium levels are normal:
Do not recommend long-term calcium supplements.
If the person is taking calcium supplements, advise them to stop.

If hypocalcaemia is identified:
Advise the use of an over-the-counter calcium supplement containing 1 to 2g of calcium. This may be needed long term (in addition to vitamin D maintenance treatment) for people with inadequate dietary calcium intake.
If the person is already taking a calcium supplement, refer to secondary care.

After 3-6 months: Check serum 25 OHD levels.

<50 nmol/L - refer to secondary care for consideration of possible causes.

>50 nmol/L *and no* ***signs*** *(page 6) of hypercalcaemia* - Maintenance treatment.

Equivalent units vitamin D to mcg
400 IU = 10 mcg
800 IU = 20 mcg
1000 IU = 25 mcg
2000 IU = 50 mcg
4000 IU = 100 mcg

Refer to an appropriate specialist: *(using clinical judgement to decide on the urgency)* if a serious underlying condition, such as cancer or a malabsorption disorder, is suspected.

Refer or seek specialist advice: *(depending on clinical judgement)*

- fragility fracture, documented osteoporosis, or high fracture risk.
- Treatment with an antiresorptive drug for bone disease.
- Raised parathyroid hormone levels.
- On antiepileptic drug/ oral corticosteroid, or on long-term treatment with other drugs (refer to page 3) known to cause vitamin D deficiency.
- Malabsorption disorder or other condition (refer to page 3) known to cause vitamin D deficiency.
- co-existing condition associated with increased sensitivity to vitamin D (such as sarcoidosis, tuberculosis, lymphoma, or primary hyperparathyroidism).
- Pregnant women.
- Unexplained deficiency.

Management of Serum 25 OHD in CHILDREN

< 25 nmol/L Deficient

PRESCRIBE
Loading dose treatment

The doses currently advised are:

- **Age 1 to 6 months:** 3,000 units daily for 8 to 12 wks.
- **Age 6 months-12 years:** 6,000 units daily for 8 to 12 wks.
- **Age 12-18 years:** 10,000 units daily for 8 to 12 wks.

These may need to be changed depending on the availability of other vitamin D preparations and evidence of alternative dosing regimens.

Acute Rx	Strength	Dose	Duration	Qty
Thorens Drops (*1,*2)	10,000 units/mL	0.3mL (15 drops) daily (3,000 units)	8 to12 weeks	Based on duration of treatment
Thorens Drops (*1,*2)	10,000 units/mL	0.6mL (30 drops) daily (6,000 units)		
Thorens Drops (*1,*2)	10,000 units/mL	1mL (50 drops) daily (10,000 units)		

*1 Does not contain any nut or soya derived ingredients
*2 Suitable for vegetarians
For preparations suitable for vegans refer to page 4

25 to 50 nmol/L Inadequate in some children

OTC Maintenance treatment* and advice

Safe sun exposure and adequate dietary calcium.

Oral preparations containing vitamin-D 400 to 600 IU/day for patients aged 1 month to 18 years, **purchased OTC*** (refer to page 8). This should be continued unless there is a significant lifestyle change to improve vitamin D status.
Retesting is not normally required if the individual is asymptomatic and compliant with multivitamin supplements.

Followed by daily supplemental doses

Ensure dietary calcium intake is adequate

> 50 nmol/L **Sufficient** for most children

Reassurance and advice

Safe sun exposure (refer to page 7)

OTC Supplementation*:

- **Breastfed babies from birth to one year**: 340 to 400 units daily.
- **Babies fed infant formula**: Vitamin D supplement when they are receiving <500mls of infant formula/day.
- **Children 1 to 4 years**: 400 units daily.
- **5 years or older:** consider 400 units, especially from October until the end of March.

Dietary advice: Both vitamin D and calcium (refer to page 8) are needed to prevent long-term adverse effects on the bones.

***OTC doses of Vitamin D are available to purchase in 400IU, 800IU, 1000IU, 2000IU and 4000IU** (refer to page 8)*
Maintenance treatment can be prescribed if there are safeguarding concerns.

Calculate dietary calcium intake using Institute of Genetics and Molecular Medicine calcium calculator @ http://www.cgem.ed.ac.uk/research/rheumatological/calcium-calculator/

The **recommended daily intake** of calcium is:

- **Age < 12 months:** 525 mg (13.1 mmol).
- **Age 1 to 3 years**: 350 mg (8.8 mmol).
- **Age 4 to 6 years:** 450 mg (11.3 mmol).
- **Age 7 to 10 years:** 550 mg (13.8 mmol).
- **Age 11 to 18 years (boys):** 1000 mg (25.0 mmol).
- **Age 11 to 18 years (girls):** 800 mg (20.0 mmol).

Many children with vitamin D deficiency rickets have a poor dietary calcium intake. As their bones are growing, there is a greater risk of negative calcium balance. Therefore, in children consideration should always be given to the need for calcium supplementation. Many children with vitamin D deficiency will have a depleted calcium status and/or a poor calcium intake and may therefore benefit from advice about dietary calcium intake. In some cases calcium supplementation may be worthwhile over the period of vitamin D treatment.

If the child or young person has an inadequate dietary calcium intake, advise on dietary measures to correct this. If they are unable or unwilling to increase their dietary calcium, consider the need for supplemental calcium (in addition to high-dose vitamin D) - consider seeking specialist advice.

The **supplemental calcium** doses currently advised in the BNF for Children are:

- **Age 1 month to 4 years:** 0.25 mmol (10 mg) per kg four times daily, adjusted to response.
- **Age 5 to 12 years:** 0.2 mmol (8 mg) per kg four times daily, adjusted to response.
- **Age 12 to 18 years:** 10 mmol (400 mg) four times daily, adjusted to response.

If symptoms and signs have not improved despite satisfactory 25(OH)D levels, consider an alternative diagnosis (refer to page 3)

Refer or seeking specialist advice:

- If suspected to have a serious underlying condition (such as cancer) - refer appropriately.
- Clinical features of rickets (such as bone deformities) - refer to a paediatrician.
- Other musculoskeletal symptoms (such as muscle pain or weakness).
- hypocalcaemia:
  - symptomatic (irritability, tetany, seizures, or other neurological abnormalities), refer immediately to A&E.
  - asymptomatic, seek specialist advice from a paediatrician.
- malabsorption disorder (for example Crohn's disease) or other condition (refer to page 3) known to cause vitamin D deficiency.
- taking a drug (refer to page 3) that can increase the risk of vitamin D deficiency (such as some antiepileptics or oral corticosteroids) or the risk of vitamin D toxicity (such as a thiazide diuretic or digoxin).
- Raised parathyroid hormone levels.
- co-existing condition associated with increased sensitivity to vitamin D (such as sarcoidosis, tuberculosis, lymphoma, or primary hyperparathyroidism).
- fragility fracture, documented osteoporosis, or high fracture risk.

Monitoring

Following High Dose treatment

At end of treatment:

- Check adjusted serum calcium levels.

Consider checking serum calcium levels more regularly in people receiving calcium supplements in addition to high-dose vitamin D treatment.

- **Hypercalcaemia or normal calcium levels**: as above (refer to adult guidance)
- **Hypocalcaemia:** Refer to A&E immediately if the person is symptomatic (irritability, tetany, seizures, or other neurological abnormalities), *or* seek advice from a paediatrician if asymptomatic.

- Check serum phosphate and alkaline phosphatase (ALP) levels.
- Refer to secondary care if there is persisting low serum phosphate or low/high ALP.

After 3-6 months:
Check serum 25 OHD levels.
> 50 nmol/L and bone profile (calcium, phosphate, and ALP) is normal:
Advise that the person should take a daily vitamin D supplement throughout the year.

< 50 nmol/L, refer to secondary care for consideration of possible causes.

Management options for poor compliance include giving a large dose of vitamin D (for example 300,000 international units [IU]) as a single or divided dose for people aged 12 to 18 years.

When should vitamin D be tested?

- **Do not routinely test for vitamin D deficiency.**
- **Test for vitamin D deficiency, by measuring serum 25-hydroxyvitamin D (25[OH]D) levels, if a person presents with the following:**
  - 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 - this may be marked, is 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.
  - Has a risk factor for Vitamin D deficiency, including:
    - Dark skin (for example those of African, African-Caribbean, or Asian or Middle-Eastern ethnic origin).
    - Limited sun exposure, for example people who cover up their skin for cultural reasons (for example Muslim women) or for health reasons (for example people with skin photosensitivity or a history of skin cancer) or spend very little time outdoors (for example those who are housebound or institutionalized).
    - Are at increased risk of nutritional deficiency, for example vegans and those who do not eat fish, or generally have a poor diet.
    - Are pregnant or breastfeeding.
    - Are elderly (65 years and older).
    - Have conditions that can cause low Vitamin D levels such as coeliac disease, cystic fibrosis, crohn's disease, severe liver failure, pancreatic insufficiency, chronic kidney disease (CKD), kidney failure, nephrotic syndrome, cancer.
    - Taking certain drugs such as antiepileptic drugs (especially carbamazepine, phenobarbital, and phenytoin), colestyramine, rifampicin, corticosteroids, highly active antiretroviral treatment (HAART), and drugs that reduce fat absorption (for example orlistat).
    - Are obese (body mass index greater than 30 kg/m^2) or have had gastric bypass surgery.
    - Have a family history of vitamin D deficiency.
- **Also test for vitamin D deficiency if there is a clinical reason to do so, for example:**
  - Prior to specific treatment where correcting vitamin D deficiency is appropriate.
  - If the person has a bone disease that may be improved with vitamin D treatment, such as osteomalacia, osteoporosis, or Paget"s disease.
  - If the person has had a fall.
  - If the person has features of hypocalcaemia (rare), including muscle cramps, carpopedal spasm, numbness, paraesthesias, tetany, or seizures.

Considerations for alternative diagnosis

- **Conditions that may present with bone pain and/or muscle weakness include:**
  - **Certain cancer,** including:
    - Bone cancer - increasing, unexplained, or persistent bone pain or tenderness, particularly at rest (and especially if not in the joint); swelling; and unexplained limp. See the CKS topic Bone and soft tissue sarcoma - recognition and referral for more information.

        - Soft tissue sarcoma - palpable fixed or immobile lump that is increasing in size. See the CKS topic on Bone and soft tissue sarcoma - recognition and referral for more information.
        - Myeloma - weakness, fatigue, bone pain, and, less commonly, renal failure, hypercalcaemia, and acute infection. See the CKS topic on Multiple myeloma for more information.
    - **Fibromyalgia -** pain associated with generalized morning stiffness and worsened by stress, cold, and activity.
    - **Fracture -** pain, swelling, or bruising over a bone, and deformity.
    - **Osteomyelitis -** variable pain and disability, possible evidence of soft tissue swelling and bony tenderness, and systemic features (such as weight loss and malaise).
    - **Paget's disease of the bone -** dull pain aggravated by weight bearing; bowing of weight bearing bones (especially tibia, femur, and forearm [usually asymmetrical]); mostly occurs in elderly men.
    - **Parathyroid disease (hyperparathyroidism causing hypercalcaemia) -** bone pain, muscular weakness, gastrointestinal symptoms (such as anorexia and nausea), renal stones, cardiac arrhythmias, and neurological symptoms (such as depression and confusion).
    - **Polymyalgia rheumatica -** bilateral shoulder and/or pelvic girdle pain and stiffness lasting for at least 45 minutes after waking or periods of rest; usually occurs in people aged over 50 years of age.
    - **Rheumatoid arthritis -** pain, swelling, and heat in the affected joints.
- **Conditions that may present with painless muscle weakness include:**
    - **Polymyositis and dermatomyositis -** may also present with cutaneous changes in dermatomyositis and increased serum creatine kinase.
    - **Thyroid disease -** presents with a wide range of symptoms and signs, including tiredness and weakness.
    - **Muscular dystrophies -** progressive degeneration and weakness of some muscle groups.

Preparations of Vitamin D suitable for special dietary requirements

Vitamin D_3 (Colecalciferol) is the preparation of choice for the treatment of vitamin D deficiency. The current consensus is that it raises serum vitamin D concentrations more effectively than vitamin D_2 (Ergocalciferol). Vitamin D_2 is recommended for strict vegans because it is derived from plant sources, unlike vitamin D_3 which is derived from animal sources. Several preparations of Vitamin D contain peanut and soya derived ingredients such as arachis (nut) oil. Manufacturers may change their formulation, therefore current status of the product ingredients should be obtained from the manufacturer.

Refer to the following documents for further information regarding preparations of Vitamin D suitable for special dietary requirements**:**

- **For people with peanut or soya allergy,** see the UK Medicines Information (UKMi) document 'Is there a suitable vitamin D product for a patient with a peanut or soya allergy?' click here
- **For people on a vegetarian or vegan diet,** see the UKMi document 'Which vitamin D preparations are suitable for a vegetarian or vegan diet?' click here
- **For people with halal or kosher requirements,** the UKMi document 'Which vitamin D preparations are suitable for a vegetarian or vegan diet?' click here to find some information on halal and kosher compliant vitamin D products.

Treatment of Vitamin D deficiency in breastfeeding mothers

The following is based on information available to The West Midlands Medicines Information Service & UK Drugs in Lactation Advisory Service on the 20th June 2018. It is not valid indefinitely. To submit a medicines-related breastfeeding enquiry:
Email: ukdilas.enquiries@nhs.net
Telephone: 0116 258 6491 or 0121 424 7298 (Mon–Fri 9.00–17.00)

****This information applies to infants born full-term and healthy. If the infant is not full-term and healthy, please contact The West Midlands Medicines Information Service & UK Drugs in Lactation Advisory Service directly for individualised advice.****

- Milk levels of vitamin D or 25(OH)-vitamin D are related to maternal plasma levels. Hence, if a mother is vitamin D deficient, her milk is also likely to be deficient.
- Low doses of vitamin D supplementation (e.g. 400 units daily) are unlikely to make any difference to vitamin D levels in the breast milk (or, indeed, much difference to maternal levels).
- Supplementation of a vitamin D deficient mother at a dose of 4000 to 6000 units daily may be required in order to allow maternal vitamin D levels to reach the normal range and also ensure that breast-milk contains enough vitamin D to also maintain infant vitamin D levels in the normal range.
- Doses of vitamin D of up to 10,000 units daily (or 70,000 units weekly), if required for treatment or prophylaxis of maternal vitamin D deficiency, may be used during lactation without need for routine monitoring of infant calcium levels.
- More frequent dosing (e.g. daily/twice weekly) is preferred as giving very high doses less often increases the risk of either mother or infant experiencing toxic 'peak' levels of vitamin D, but weekly or monthly dosing may be used if maternal compliance with a more frequently-dosed regimen is doubtful. Very high "once only" doses (e.g. 300,000 units stat) should be avoided if possible.
- The lowest maternal dose of vitamin D at which neonatal adverse effects have been *noted* is approximately 40,000 units daily.

Drug interactions

The key drug interactions associated with vitamin D are listed below. Seek specialist advice as appropriate during concurrent treatment with these drugs.

- **Antiepileptic drugs (phenytoin or barbiturates) -** can increase the metabolism of vitamin D, leading to a reduction in the effects of vitamin D.
  - Higher doses of vitamin D may be needed.

- **Cardiac glycosides -** excessive dosing of vitamin D can induce hypercalcaemia, which may enhance the effects of digoxin and other cardiac glycosides (leading to an increased risk of digoxin toxicity and serious arrhythmias).
  - Close monitoring (and possibly a dose reduction of vitamin D) is needed during concurrent use.

- **Corticosteroids -** may increase vitamin D metabolism and elimination.
  - Higher doses of vitamin D may be needed.

- **Ion exchange resins (such as colestyramine) or laxatives (such as paraffin oil) -** may reduce the gastrointestinal absorption of vitamin D.
  - Higher doses of vitamin D may be needed.

- **Miconazole -** the effects of vitamin D are possibly reduced by miconazole.
  - Higher doses of vitamin D may be needed.

- **Orlistat -** may prevent the absorption of vitamin D, even in people also taking multivitamins.
  - Advise that vitamin D preparations should be taken at least 2 hours after taking orlistat. It may be necessary to monitor vitamin D levels, even if multivitamins are given [Preston, 2015].

- **Thiazide diuretics (such as bendroflumethiazide) -** may reduce the urinary excretion of calcium thereby increasing the risk of hypercalcaemia.
  - Close monitoring (and possibly a dose reduction of vitamin D) is needed during concurrent use.

Vitamin D toxicity

Vitamin D toxicity (which rarely occurs unless the vitamin D dose is very high) manifests mainly through chronic hypercalcaemia, leading to deposition of calcium in soft tissues, diffuse mineralization of bone, and irreversible renal and cardiovascular toxicity.

- **The clinical features of hypercalcaemia include:**
  - Nausea and vomiting.
  - Diarrhoea.
  - Constipation.
  - Anorexia and weight loss.
  - Lethargy.
  - Polyuria and thirst.
  - Sweating.
  - Headache.
  - Vertigo.
  - Raised concentrations of calcium and phosphate in plasma and urine.

- **If hypercalcaemia is suspected,** check serum calcium levels. If hypercalcaemia is identified:
  - Assess the person's state of hydration, and consider admission if the person is dehydrated.
  - If the person is taking a calcium supplement, advise that it should be stopped.

Other adverse effects that have been linked with high vitamin D intakes or high serum 25-hydroxyvitamin D (25 [OH]D) concentrations include an increased incidence of falls and fractures, an increased rates of pancreatic and prostate cancer, and increased total mortality (that is, from all causes combined). However, evidence for these associations is less robust and consistent than that relating to hypercalcaemia [SACN, 2016].

Contraindications and cautions of calcium supplements

- **Do not prescribe calcium supplements to people with:**
  - Severe hypercalcaemia and/or hypercalciuria (for example in hyperparathyroidism, vitamin D overdose, and decalcifying tumours [such as plasmacytoma and skeletal metastases]).
  - Severe renal failure untreated by renal dialysis.
  - Osteoporosis due to immobilization.
  - Nephrolithiasis.
- **Prescribe calcium supplements with caution to people with:**
  - Mild to moderate renal impairment.
  - A co-existing condition associated with increased sensitivity to vitamin D (such as sarcoidosis, tuberculosis, lymphoma, or primary hyperparathyroidism) - consider seeking specialist advice.
  - A history of nephrolithiasis.
  - Respiratory acidosis or respiratory failure.

Adverse effects of calcium supplements:

- **Adverse effects of calcium supplements are uncommon.**
- Overdose can lead to hypercalcaemia, hypercalciuria, and, very rarely, milk-alkali syndrome (characterized by frequent urge to urinate; continuing headache; continuing loss of appetite; nausea or vomiting; unusual tiredness or weakness; hypercalcaemia, alkalosis, and renal impairment).
- Rarely, gastrointestinal adverse effects (such as constipation, dyspepsia, flatulence, nausea, abdominal pain, and diarrhoea) may occur.
- Very rarely, skin disorders (such as itching, rash, and urticaria) may occur.

Lifestyle advice

There are three main sources of Vitamin D:

1. Safe sun exposure
2. Diet
3. Supplements

Safe sun exposure

- Exposing commonly uncovered areas of the skin (such as the forearms and hands) for short periods when in strong sunlight provides vitamin D. Longer periods of exposure may be needed for those with darker skin.
  - Many people will have experienced sunburn. They can use this experience to know what their skin looks like normally, how it reacts to sunlight, how long they can be exposed without risking sunburn, and how to protect their skin accordingly.
  - Advise that skin that is not usually exposed to sunlight (for example the back, abdomen and shoulders) is particularly likely to burn, so extra care is needed.
- Prolonged exposure to strong sunlight (for example leading to burning or tanning) does not lead to excess production of vitamin D, as a regulation mechanism exists to destroy excess vitamin D, but increases the risk of skin cancer.
- Between March and October in the UK, people should protect their skin from burning by covering up with suitable clothing (such as long-sleeved tops, a broad-brimmed hat, or long skirts and trousers); seeking shade (especially between 11am and 3pm); and applying sunscreen, which should:

- Meet minimum standards for ultraviolet A (UVA) protection - the label should have the letters 'UVA' in a circle logo and should preferably state that it provides good UVA protection (for example at least '4-star UVA protection').
- Provide at least sun protection factor (SPF) 15 to protect against UVB.
- Be applied liberally and frequently, according to the manufacturer's instructions. If the sunscreen is applied too thinly, the amount of protection it gives is reduced.

- Sunbeds are not an effective method of protecting against vitamin D deficiency because they emit high levels of UVA, which do not contribute to vitamin D synthesis but increase the risk of skin cancer.

Dietary advice

In the winter months in the UK (from October to March), sunlight contains very little of the UVB needed to synthesize vitamin D. It therefore has to be obtained from body stores (from UVB exposure in the summer months) and dietary sources, including natural foods, fortified foods, and food supplements.

- **Dietary intake of vitamin D.**
  - It is important to maintain dietary intake of vitamin D by taking vitamin D supplements, especially during the winter months, as it is difficult to obtain sufficient vitamin D from food sources alone because they are limited.
  - Provide patient with BDA food facts sheet (click here) on Vitamin D.
- **Dietary intake of calcium.** Advise that:
  - It is also important to maintain dietary intake of calcium, as both calcium and vitamin D are needed to prevent long-term adverse effects on the bones.
  - Provide patient with BDA food facts sheet (click here) on calcium.

Supplements for maintenance

Long-term supplementation for maintenance of vitamin D and, where necessary, calcium should be purchased over the counter or obtained via the healthy start scheme (if eligible). Adhered to supplementation is necessary in order to prevent recurrence of deficiency and to maintain bone health. Maintenance doses of Vitamin D/ Calcium can be prescribed if there are safeguarding concerns.

Many preparations of vitamin D and Calcium can be purchased over the counter (refer to pages 9 to 14). For further information on specific products available for purchase, patients can seek advice from their community pharmacy.

Healthy Start Vitamins

Women and children from families who are eligible for the Government's Healthy Start scheme can get free vitamin supplements which include vitamin D, in the form of tablets for women and drops for children, from Family Hubs (previously known as children's centres) throughout West Essex.

Healthy start vitamins are recommended for pregnant women, women with a baby under one year old and children from six

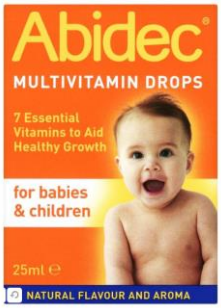
months old to their fourth birthday. Babies under six months old who are fully breastfed might benefit from them earlier.

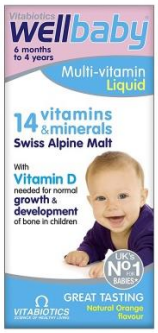
Healthy Start vitamins cannot be prescribed. Families on the Healthy Start Voucher Scheme should be encouraged to liaise with their health visitor or healthy family support workers about where they can get their healthy start vitamins.

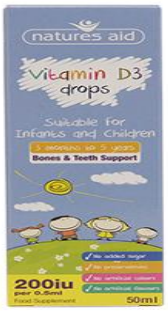
The Tree House Children's Centre Parnall Road Harlow CM18 7NG Telephone: 01279 772600
The Meadows Children's Centre Harberts Road Harlow CM19 4DL Telephone: 01279 773900
For further information visit www.healthystart.nhs.uk

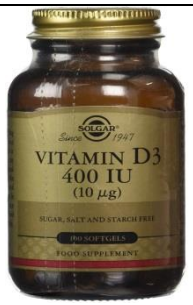
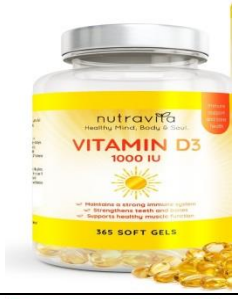
Different strengths of Vitamin D are widely available to purchase for maintenance doses

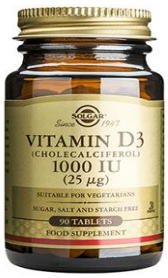
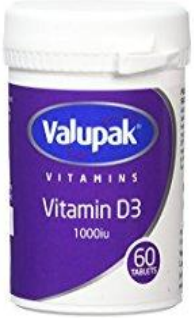
Please note this is not an exhaustive list and should be used for guidance only. WECCG do not recommend or endorse any particular product/s. Those shown are examples of the types of product available. People should be encouraged to shop around and choose their preferred product.

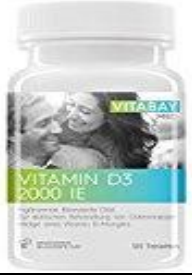
Product	Allergens	Suitability for special dietary requirements	Dose	Cost	
Multivitamins containing vitamin D Products suitable for children					
Supermarket own brand multivitamins One tablet contains 400units (10 mcg)	See information from individual manufacturer's packaging	See information from individual manufacturer's packaging	Dose: See information from individual manufacturer's packaging	30 cost approximately £1.40	Available from most major supermarkets
Abidec multivitamin drops (from birth to 12 years) *0.6ml contains 400units (10* mcg)	Contains peanut oil	Suitable for vegetarians and vegans	Dose: Children aged 1 to12 years: one 0.6ml dose daily	25ml costs approximately £3.50 to £5.00	

Natures Aid Multi-vitamin drops *1ml contains 300units (7* mcg)	Lactose, yeast, gluten free	Suitable for vegetarians	Dose: Children 3 months to 5 years: 1ml daily Not suitable for infants consuming more than 500ml of milk formula	50ml costs approximately £5.75 to £7.95	
Wellbaby Liquid multi-vitamin *5ml contains 280 units (7* mcg)	Peanut oil free Lactose, salt, yeast and alcohol free	Suitable for vegetarians	Dose: Babies 4months to 6months: 2.5ml daily, children 7months to 4 years: 5ml daily	150ml costs approximately £4.50 to £5.69	
Products suitable for dosage of 400 units (10mcg) **Products suitable for children**					
Supermarket own brand-Vitamin D for children. One tablet contains 400units (10 mcg)	See information from individual manufacturer's packaging	See information from individual manufacturer's packaging	See information from individual manufacturer's packaging	30 cost approximately £3.99	Available from most major supermarkets
BetterYou DLux Junior spray (from 3 years) *1 spray contains 400units*	Alcohol, lactose and gluten free	Suitable for vegetarians	Dose: 1 spray daily (under the tongue or on the inside of the cheek)	15ml costs approximately £4.41 to £6.29	
Baby D drops (from birth) *1 drop contains 300units*	Gluten, soya, wheat, corn, dairy, sugar and peanut free	Suitable for vegetarians	Dose: 1 drop daily Specifically designed for breast-fed babies and infants	60 drops cost approximately £9.99	

Natures Aid Vitamin D3 drops (from birth to 5 years) *1ml contains 400units*	Gluten, soya, wheat, corn, dairy, lactose, starch, sugar and nut free	Suitable for vegetarians	Dose: 1ml daily Not suitable for infants consuming more than 500ml of milk formula Once opened use within 4 months	50ml cost approximately £6.95	
HalibOrange softies Vitamin D and Calcium *2 softies contain 400units*	Contains bovine gelatine	Not suitable for vegetarians or vegans	Dose: Children 3 years and above: One to Two softies daily	30 cost approximately £4.50 to £4.89	
Products suitable for dosage of 400 units (10mcg) – 800 units (20mcg)					
Supermarket own brand Vitamin D One tablet contains 400units (10 mcg)	See information from individual manufacturer's packaging	See information from individual manufacturer's packaging	Dose: See information from individual manufacturer's packaging	90 cost approximately £2.29	Available from most major supermarkets
Holland & Barrett Vitamin D3 10mcg	Gelatine, salt, sugar, lactose, soya, gluten, wheat, fish free	Suitable for vegetarians	Dose: One to two softgel capsules daily	100 cost approximately £4.99	

Holland & Barrett Mushroom Vegan Vitamin D 10mcg capsules		Suitable for vegetarians and vegans	Dose: One to two capsules daily	60 cost approximately £15.99	
Solgar Vitamin D softgels 10mcg	Contains Gelatine Gluten, Wheat soya and Dairy free	Not suitable for vegetarians of vegans	Dose: One to two softgel capsules daily	100 cost approximately £4.85	
SunVit D3 2000IU/ml liquid *1 drop contains 100iu*	Alcohol, Sugar, peanut, gluten, gelatin and soya free	Suitable for Vegetarians, Halal certified	Dose: Children under 12 years: 2 to 8 drops daily. Adults: 4 to 10 drops daily	20ml cost approximately £8.20	
Products suitable for dosage of <u>1000units (25mcg)</u>					
Supermarket own brand Vitamin D 1000units (25mcg) tablets	See information from individual manufacturer's packaging	See information from individual manufacturer's packaging	Dose: See information from individual manufacturer's packaging	90 cost approximately £3.50 to £4.99 180 cost approximately £8.99	Available from most major supermarkets
Nutravita Vitamin D3 1000IU soft gels	Wheat, lactose, gluten free	Not suitable for vegetarian or vegans Contains gelatine	Dose: One capsule daily	365 cost approximately £8.97	
Vitabiotics Ultra D3 tablets 1000 units (25mcg)	Lactose and gluten free	Suitable for vegetarians	Dose: One tablet daily	96 cost approximately £4.60 to £5.39	

Solgar Vitamin D3 1000 units (25mcg) tablets	Dairy, gluten, soya and wheat free	Suitable for vegetarians	Dose: One tablet daily	90 cost approximately £7.69 180 cost approximately £9.45	
Valupak Vitamin D3 1000IU (25mcg)	Sugar, Gluten and Yeast free	Suitable for Vegetarians	Dose: One tablet daily	60 cost approximately £0.99	
Holland & Barrett Vitamin D3 spray 25mcg	Sugar, salt, corn, porcine and yeast free	Suitable for vegetarians	Dose: One spray into the mouth daily	50ml cost approximately £9.99	
Maxx Labs Vitamin D Vegan formula 1000IU per drop	Egg, Wheat, soy, fish, salt, sugar, corn and gluten free	Suitable for vegetarians and vegans	Dose: 10 drops daily	30ml cost approximately £12.99	
Holland & Barrett Mushroom Vegan Vitamin D 25mcg capsules	Sugar, yeast, salt free	Suitable for vegetarians and Vegans	Dose: One to Two capsules daily	60 cost approximately £8.99	
Products suitable for dosage of 2000 units (50mcg)					

Reflex Vitamin D3 2000 units capsules (from 16 years)		**Not** suitable for vegetarians or vegans Contains bovine gelatine – Halal safe (as per Halal Trust)	Dose: One capsule daily	100 cost approximately £11.99	
Kirkland signature Vitamin D3 capsules 2000IU	Yeast, Starch and gluten free	Not suitable for vegetarians of vegans Contains Gelatin	Dose: One softgel daily	600 cost approximately £7.99	
Liquid Vitamin D3 2000IU per drop	Yeast, egg, wheat, soy, fish, salt, corn, peanuts, and gluten free.	Suitable for vegetarians	Dose: One drop daily	30ml cost approximately £22.00	
Vitabay Vitamin D3 2000IU tablets	Gluten, lactose, fructose , vegetable and paraben free	Suitable for vegans and vegetarians	Dose: One tablet daily	120 cost approximately £11.37	

Acknowledgment: Adapted from Mid Essex CCG, Prescribing policy on Vitamin D supplementation, August 2017.

Please note: Equivalent units vitamin D to mcg:

400 IU = 10 mcg
800 IU = 20 mcg
1000 IU = 25 mcg
2000 IU = 50 mcg
4000 IU = 100 mcg

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https://www.sps.nhs.uk/articles/is-there-a-suitable-vitamin-d-product-for-a-patient-with-a-peanut-or-soya-allergy/

UKMi suitable preparation for vegetarian or vegan diet
https://www.sps.nhs.uk/articles/which-vitamin-d-preparations-are-suitable-for-a-vegetarian-or-vegan-diet/

West Midlands Medicines Information Service & UK Drugs in Lactation Advisory Service. Query regarding treatment of Vitamin D deficiency in breast feeding mothers answered on the 20th June 2018. ukdilas.enquiries@nhs.net

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