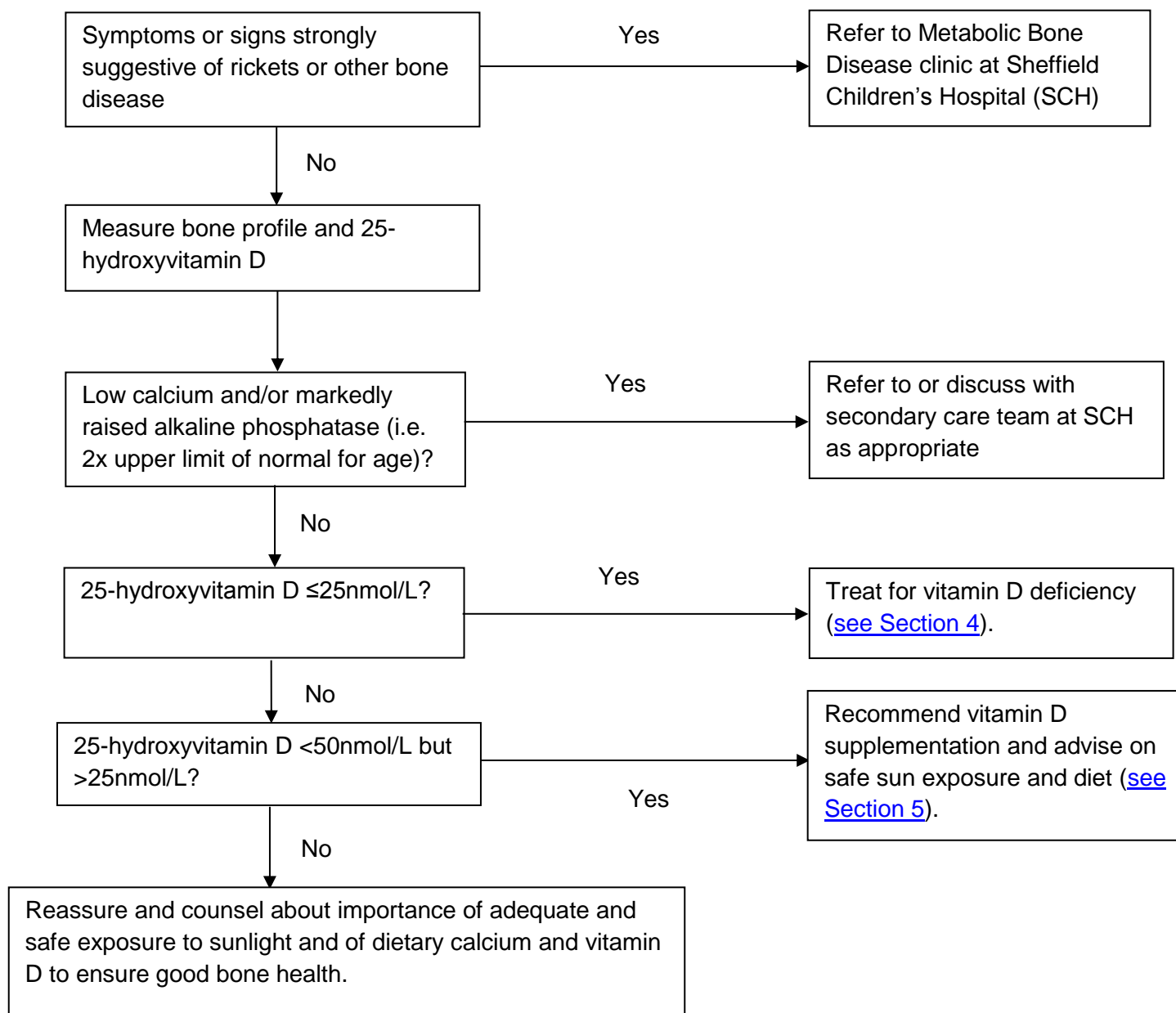


## Guidelines for the management of children with suspected vitamin D deficiency in a primary care setting

### Management flowchart of patients suspected to have vitamin D deficiency



## Guidelines for management of children with suspected vitamin D deficiency in primary care setting

This guidance has been designed for use by General Practitioners in Sheffield. The content is suitable for children up to the age of 16 years of any ethnic group. The Sheffield guidance on [optimising Vitamin D for bone health \(for adults\)](#) should be used for those over the age of 18 (NB – see [below](#) for advice for 16-18 year olds).

### 1. Vitamin D deficiency in children

- Lack of vitamin D in children results in reduced absorption of calcium leading to skeletal deformities (rickets), disturbance in growth and hypocalcaemia in children.
- 85-90% of our daily vitamin D requirement is obtained by the action of UVB sunlight on the skin (only possible during April to September in the UK).
- 10 -15% is obtained through diet (oily fish such as sardines, mackerel, or salmon, liver, egg yolks, fortified margarine and fortified breakfast cereals).
- Healthcare professionals should recommend and record supplement use in all children under 5 years and offer advice regarding obtaining vitamin D from [safe sun exposure](#) and diet.
- Public Health England (PHE) recommends daily vitamin D supplements in **all children** from birth (unless they are receiving over 500mls of infant formula milk daily) up to 4 years. The vitamin D requirement set for babies and infants up to the age of 1 is 8.5 - 10micrograms a day (340 - 400 units a day) and the recommendation for children over 1 is 10micrograms a day (400 units). In July 2016, Public Health England advised that all individuals should consider vitamin D supplementation, particularly during the autumn and winter months and throughout the year if they are at risk of vitamin D deficiency
- Children from families who are eligible for the Government's [Healthy Start](#) scheme should be signposted to their local '[Children's Centre](#)' to receive their supplements. Patients not eligible for vouchers can buy Healthy Start children's drops from all Children's Centres in Sheffield or be signposted to their local pharmacy who will be able to sell them a suitable supplement
- Please note: Sheffield CCG have secured funding to help encourage the best start in life for children living in Sheffield. This includes the issuing of free 'Healthy Start Vitamins for Women' for preconception women and pregnant women throughout the duration of pregnancy. It also includes a free two month supply for breastfeeding mums. Children will also receive a free two month supply of 'Healthy Start Vitamins for Children' if they are breastfed and a voucher to receive a free two month supply for bottle fed babies (once they are on less than 500mL of infant formula). Children who are classed as at risk of vitamin D deficiency are also entitled to receive free supplementation up until their fourth birthday. For further information, please contact a local health visitor or midwife.
- Improving the availability and uptake of vitamin D supplements for children in multiethnic populations is essential to the strategy of rickets prevention.
- During treatment of deficiency consider referral to secondary care at any stage if new symptoms cause parental or professional concern.

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## 2. Identification of children at risk of vitamin D deficiency

Any child whom you suspect to be hypocalcaemic secondary to vitamin D deficiency should be urgently referred to secondary care (see below).

Risk factors for vitamin D deficiency include;

- Reduced exposure to sunlight due to routine covering of face and body, housebound, prolonged institutional care or excessive use of high factor sun block.
- Skin types with greater pigmentation i.e. darker skin types.
- Prolonged breastfeeding without vitamin D supplementation and / or delayed weaning.
- Maternal vitamin D deficiency.
- Diet insufficient in calcium or vitamin D.
- Chronic disease (renal, hepatic or malabsorption syndromes e.g. coeliac disease, cystic fibrosis).
- Rare genetic causes including vitamin D resistant rickets, and renal tubular acidosis.
- Medication that induces hepatic enzymes e.g. anticonvulsants.
- Obesity (vitamin D is fat soluble and as such obese patients may have increased requirements due to deposition in the adipose tissue).

Symptoms and signs that are associated with vitamin D deficiency include:

- Longstanding (>3 months) unexplained bony pains
- Muscular weakness e.g. difficulty climbing stairs, rising from chair, waddling gait, or delayed walking
- Dental deformities (delayed tooth formation, enamel hypoplasia)
- Symptoms and signs of rickets and hypocalcaemia (see below)

Due to high risk of recurrent vitamin D deficiency annual enquiry for symptoms & signs is suggested, and re-treatment may be necessary. Safe sun exposure and diet should be reinforced and adherence to supplement checked where appropriate.

### Rickets

The commonest cause of rickets is simple nutrient deficiency from low sun exposure combined with inadequate dietary intake. Malabsorption syndromes such as coeliac disease and cystic fibrosis should be considered, especially where there is a poor response to vitamin D treatment. Certain metabolic, renal and liver diseases can also lead to rickets. Peak incidence of rickets is between 3 and 18 months of age. A deficient state exists for months before there are any signs on physical examination. Children with rickets are often miserable and in pain.

Symptoms and signs of rickets:

- progressive or abnormal bowing of legs (genu varum) or knock knees (genu valgum)\*
- anterior bowing of the femur
- wrist swelling (distal radius)
- prominent costochondral joints (“rickety rosary”)

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- softening of the skull with frontal bossing, and delayed fontanelle closure
- spinal curvature
- bone pain

\*Note that some varus or valgus “deformity” is normal in certain age groups.

## Hypocalcaemia

Vitamin D deficiency can result in a low serum calcium, particularly during periods of rapid growth e.g. infancy and adolescence. Symptoms of hypocalcaemia include irritability, tetany, and seizures. If you believe that such symptoms are present and likely to be due to a low serum calcium then the child should be immediately referred to hospital-based paediatric services.

### 3. When to test

If a patient presents with any of the above symptoms and /or there are other strong reasons to suspect vitamin D deficiency check vitamin D and bone profile.

A blood sample can be taken and a request made for measurement of a bone profile (calcium, phosphate and alkaline phosphatase) and vitamin D (25-hydroxyvitamin D – (25-(OH)D)). The minimum sample required for these is 1.5ml blood to be sent in either a lithium heparin or plasma sample bottle. Patients with a low calcium and/or markedly raised alkaline phosphatase (i.e. 2x upper limit of what is normal for the age) should be referred to or a discussion had with secondary care at SCH, as appropriate.

Patients who are diagnosed and subsequently treated for vitamin D deficiency should have a repeat bone profile and 25-hydroxyvitamin D concentration performed shortly after completion of treatment (i.e. 2-3 months after commencement of treatment). They then may be reviewed annually for symptoms and compliance with supplements (see below). If asymptomatic and there is no reason to suspect deficiency further re-tests of vitamin D levels are **not** normally required.

## 4. Management of vitamin D deficiency (serum 25(OH)D $\leq$ 25nmol/l)

### 4.1 Initial treatment of vitamin D deficiency

All patients that have a serum 25(OH)D level  $\leq$ 25nmol/l should be treated with vitamin D

The Metabolic Bone Disease Team at SCH commonly use one of two options for the treatment of vitamin D deficiency; **standard dose treatment or high dose treatment** (see below). They do not routinely recommend administration of vitamin D as an intramuscular dose.

The dosing options used are based on those recommended in the BNFC, National Osteoporosis Society clinical guideline (Vitamin D and bone health: A practical clinical guideline for the management in children and young people) and the Royal College of Paediatrics and Child Health guide for vitamin D in childhood. Please note these differ from doses recommended for currently licensed preparations.

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The preparation of vitamin D to be used, either colecalciferol or ergocalciferol, depends on both dose and availability. Due to ongoing supply problems with ergocalciferol, colecalciferol is the current recommended preparation.

There is no place for the use of 1 $\alpha$ -hydroxylated preparations e.g. alfacalcidol or calcitriol in the routine management of vitamin D deficiency.

#### 4.1.1 Option 1 – Standard dose treatment

Suggested dosing in local guidance is based on RCPCH (Guide for vitamin in childhood) and NOS guidelines; (Vitamin D and bone health – a practical clinical guideline for management in children and young people).	Sheffield formulary preparation
1 month – 6 months - 3000 units daily as an oral dose for 4 weeks	*THORENS 10,000 units /ml 3000 units /0.3ml /day – 8.4ml needed , prescribe 10ml
6 months - 2 years – 3000 units daily as an oral dose for 8 weeks	*THORENS 10,000 units /ml 3000 units / 0.3ml /day – 16.8ml needed, prescribe 20ml
2-8 years – 6000 units daily as an oral dose for 6 weeks	*THORENS 10,000 units /ml 6000 units /0.6ml /day – 25.2mls needed, prescribe 30ml
8-11 years – 6000 units for 8 weeks	*THORENS 10,000 units /ml 6000 units /0.6ml / day – 33.6mls needed, prescribe 40mls
12 - 16 years – 10 000 units daily as an oral dose for 8 weeks (or following dosing instruction in the Sheffield Adult Guidelines). Base decision on whether child has completed growth.	*THORENS 10,000 units /ml 10,000 units / 1ml / day – 56mls needed, prescribe 60mls <b>OR</b> **Pro D3 10,000 unit capsules, one daily
16-18 years - 10 000 units daily as an oral dose for 8 weeks Or follow dosing instruction in the Sheffield adult guidelines. Base decision on whether child has completed growth.	*THORENS 10,000 units /ml 10,000 units / 1ml / day – 56mls needed, prescribe 60mls <b>OR</b> **Pro D3 10,000 unit capsules, one daily

\*Off label dose      \*\*Unlicensed nutritional supplement

#### 4.1.2 Option 2 – High dose treatment (only in those aged 12 years and over with poor compliance – **discuss with paediatrician**)

300,000 units either as a single oral dose or two divided doses.

#### 4.1.3 Calcium Supplementation

Always consider the need for improving calcium intake. Many children with vitamin D deficiency will have a depleted calcium status and/or a poor calcium intake and may therefore benefit from

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advice about dietary calcium intake (see appendix 2). In some cases calcium supplementation may be worthwhile over the period of vitamin D supplementation.

**This table summarises considerations that need to be borne in mind when prescribing Vitamin D**

<b>Side effects</b>	Hypercalcaemia, polyuria, polydipsia, nausea & vomiting, diarrhoea, sweating, headache & vertigo (side effects unlikely unless hypervitaminosis D occurs e.g. following overdose)
<b>Drug interactions</b>	<p>Increased risk of hypercalcaemia when vitamin D given with thiazide and related diuretics.</p> <p>Drugs containing digitalis and other cardiac glycosides - the use of digitalis glycosides in the presence of hypercalcaemia due to vitamin D administration might result in arrhythmias. Strict medical supervision is needed, together with serum calcium concentration and electrocardiographic monitoring if necessary</p> <p>Vitamin D requirements possibly increased when given with medication that increases vitamin D metabolism e.g. barbiturates, carbamazepine, phenytoin or primidone</p>
<b>Contraindications</b>	Hypercalcaemia, metastatic calcification and sarcoidosis and other granulomatous disease

#### 4.2 Follow-up after treatment for vitamin D deficiency

Unless already referred to an outpatient clinic then follow-up should be in primary care.

If an individual has been treated for deficiency then a repeat bone profile and 25-hydroxyvitamin D concentration should be performed shortly after completion of treatment (i.e. 2-3 months after commencement of treatment) to ensure that any biochemical abnormality has resolved and that the serum 25-hydroxyvitamin D concentration is  $\geq 50$ nmol/L. If any abnormality has not resolved despite compliance with adequate vitamin D treatment and you are confident about compliance then consider referral to the Metabolic Bone Disease clinic. Discuss with secondary care team at SCH if you have any concerns about vitamin D toxicity,

If non-compliance is suspected then treatment can be repeated. In young people aged 12 years and older, observed high dose treatment ([see Section 4.1](#)) can be used as a safe and effective way to ensure compliance and adequacy of treatment. If this is needed in a primary care setting then please discuss this with a paediatrician.

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Patients who have successfully completed deficiency treatment should receive supplementation with vitamin D at a dose of 8.5 – 10micrograms (340 - 400 units) /day (dose dependent on age – see ([Vitamin D Supplementation](#)), at least until completion of growth, unless there is a significant lifestyle change to improve vitamin D status. Supplementation should start after completion of treatment.

## **5. Management of suboptimal Vitamin D (serum 25(OH)D between 26 and 50nmol/l)**

Those with an initial serum 25(OH)D level between 26 and 50nmol/l should receive vitamin D supplementation with vitamin D at a dose of 8.5 – 10micrograms (340 - 400 units) day (dose dependent on age – see [Vitamin D Supplementation](#) - at least until completion of growth, unless there is a significant lifestyle change to improve vitamin D status.

Healthy Start children's vitamin drops are available at low cost from all children's centres in Sheffield and free to families eligible for Healthy Start vouchers. General advice regarding maintenance of vitamin D levels from safe sun exposure and diet should also be given. As with children with vitamin D deficiency, consideration should always be given to calcium intake.

If a child is receiving Vitamin D supplementation for a 'suboptimal' Vitamin D level and they are asymptomatic then a re-test of Vitamin D levels are **not** normally required

## **6. PHE advice for all children**

PHE recommends vitamin D supplementation in all children up to 4 years of age and intake for all those over 4 years at a dose of 10micrograms (400 units) especially during the autumn and winter months. See [section 1](#) for further information. Healthy Start children's vitamin drops are available at low cost from all children's centres in Sheffield and free to families eligible for Healthy Start vouchers, also see details of Extended Healthy Start Scheme [above](#) and encourage OTC / self care from 4 years. General advice regarding maintenance of vitamin D levels from safe sun exposure, diet and over the counter supplements should be given.

Note from SACN report- *There is insufficient data to set RNIs for infants and children aged under 4 years. As a precaution, a 'Safe Intake' of vitamin D is recommended for these ages: in the range 8.5-10 micrograms / day (340-400 units) for ages 0 up to 1 year (including exclusively breast fed and partially breast fed infants, from birth); and 10 micrograms / day (400 units) for ages 1 up to 4 years.* It is acknowledged that Healthy Start vitamin drops contains 7.5 micrograms / 300units per dose; however the use of Healthy Start vitamins alongside safe sun exposure and dietary vitamin D intake / advice is first choice in Sheffield for children up to the age of 4 years. Self-care with OTC preparations are advised for older children.

## Appendix 1.

### Available products

#### Preparations for treatment of deficiency

Wherever possible licensed products should be used where available.

In general, UK licensed products and imported products licensed in a country of origin with a strong regulatory framework (e.g. another EU country) should be considered of high quality. In the same vein, UK manufactured special products made in MHRA-licensed facilities would be considered to offer an improved risk position compared with imported products not licensed in the country of origin. Nutritional supplements are generally subject to food safety labelling legislation and whilst this excludes them from a formal licensing process they may be considered a potentially useful option in some circumstances following a consideration of the risks.

#### Examples of licensed products

Product	Licensed dose for deficiency	Dosage / quantity required to meet dosing recommendations in guidance (off label use – counsel patient accordingly)	Other considerations
InVita D <sub>3</sub> 25,000 units / ml oral solution (colecalciferol)	0-18 years - 25,000 units every 2 weeks for 6 weeks (followed by maintenance therapy of 400-1000 units /day)	Not applicable	An olive oil based solution presented in 1ml (25,000 units) single dose ‘snap and squeeze’ plastic ampoule  D <sub>3</sub> is sourced from lanolin from sheep’s wool-company confirmed product suitable for vegetarians  Gelatin-free, PEG-free, peanut oil

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			free
THORENS 25 000 units /2.5 ml oral solution (colecalfiferol)	0-18 years 25000 units (1 bottle) once every 2 weeks for 6 weeks (followed by maintenance therapy of 400-1000 units/day)	Not applicable	An olive oil based solution presented as a single-dose bottle of 2.5 ml oral solution
THORENS 10 000 units /ml oral drops, solution (colecalfiferol)	0-18 years 2000 units /day (10 drops) for 6 weeks, followed by maintenance therapy of 400-1000 units /day (2 – 5 drops).	<p>1 month – 6 months - 3000 units daily as an oral dose for 4 weeks - 0.3ml /day – 8.4ml needed , prescribe 10ml</p> <p>6 months - 2 years – 3000 units daily as an oral dose for 8 weeks - 0.3ml /day – 16.8ml needed, prescribe 20ml</p> <p>2-8 years – 6000 units daily as an oral dose for 6 weeks -0.6ml /day – 25.2mls needed, prescribe 30ml</p> <p>8-11 years – 6000 units for 8 weeks - 0.6ml / day – 33.6mls needed, prescribe 40mls</p> <p>12 years - 16 years – 10 000 units daily as an oral dose for 8 weeks - 1ml / day – 56mls needed, prescribe 60mls</p>	An olive oil based solution
Plenachol 20,000 units capsules (colecalfiferol)	Treatment of vitamin D deficiency 12-18 years: 20 000 units (1 capsule) once every 2 weeks for 6 weeks (followed by maintenance therapy equivalent to 400-1000 units /day,)	Not applicable	Peanut, soya or gelatin free. Suitable for halal and kosher diet

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### Examples of unlicensed products

Product	Manufactures / distributor	Suggested dosing for deficiency	Other considerations
<p>Pro D<sub>3</sub> 2,000units/ml. (colecalciferol 2,000units/ml)</p> <p>Does not have UK marketing authorisation. Marketed as a nutritional supplement.</p>	<p>Available from AAH Pharmaceuticals</p> <p>or</p> <p>Phoenix Healthcare</p> <p>or</p> <p>Synergy biologics.</p> <p>0845 5197401</p>	<p>1 month-6 months – 3,000 units (1.5ml) daily for 4 weeks (supply 50ml bottle)</p> <p>6 months – 2 years – 3000 units (1.5ml) daily for 8 weeks (supply 100ml bottle)</p> <p>2-8 years – 6,000 units (3ml) daily for 6 weeks (supply 150ml bottle)</p> <p>8-11 years – 6,000 units (3ml) daily for 8 weeks (supply 2x100ml bottles)</p> <p>12 years and over – prescribe as Pro D3 10,000 unit capsules unless problems with taking solid dosage forms. If liquid required - 10,000 units (5ml) daily for 8 weeks (supply 3x100ml bottles)</p>	<p>Gelatin Free.</p> <p>Halal approved</p> <p>Free from peanut and soya related ingredients</p> <p>Prescribe as Pro D<sub>3</sub> 2,000iu/ml liquid to avoid uncontrollable high cost of unlicensed specials</p> <p>Prescribers and pharmacists should ensure the dose is written in units and mls and the patient / carer counselled appropriately.</p>
<p>Pro D<sub>3</sub> 10,000 units / capsule.  (colecalciferol 10,000units / capsule)</p> <p>Does not have UK marketing authorisation. Marketed as a nutritional supplement.</p>	<p>Available from AAH Pharmaceuticals</p> <p>or</p> <p>Phoenix Healthcare</p> <p>or</p> <p>Synergy biologics.</p>	<p>12 years and over – 10,000 units (1 capsule) daily for 8 weeks</p>	<p>Gelatin free.</p> <p>Halal approved</p> <p>Free from peanut and soya related ingredients</p> <p>Prescribe as Pro D<sub>3</sub> 10,000IU capsules</p>

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	0845 5197401		
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## Vitamin D supplementation

PHE recommends all infants and young children from birth to 1 year (including breastfed babies) should take a daily supplement containing vitamin D in the form of vitamin drops, to help them meet the requirement set for this age group of 8.5- 10 micrograms (340 - 400 units) of vitamin D per day. Please note, infants who are fed infant formula do not need vitamin drops until they are receiving less than 500ml of infant formula a day, as these products are fortified with vitamin D. All infants and young children (up to the age of 4) are advised to take a daily supplement of vitamin D and all children from 4 years upwards are advised to take a supplement containing 10micrograms (400units) of vitamin D particularly during the autumn and winter months.

Vitamin D supplementation should continue in children with a history of vitamin D deficiency or a suboptimal Vitamin D level, unless there has been significant lifestyle change to improve vitamin D status. Children with low exposure to sunlight, for example those who cover their skin for cultural reasons, who are housebound or confined indoors for long periods and children who have darker skin, for example people of African, African-Caribbean and South Asian origin, should also continue on supplements because their bodies are not able to make as much vitamin D.

### Available multivitamin / vitamin D preparations

Product	Vitamin D content	Distributor	Costings*	Dose	Other considerations
Healthy Start Drops (10ml).  Multi-vitamin preparation	Colecalciferol – 7.5micrograms (300 units) per 5 drops	<a href="http://www.nhs.uk/ServiceDirectories/Pages/ServiceSearchAdditio.html">http://www.nhs.uk/ServiceDirectories/Pages/ServiceSearchAdditio.html</a>  Also available from most	Patients should be signposted to a children's centre. Healthy Start vitamin drops for children are available free to those eligible for Healthy Start vouchers and at low cost to those not	7.5 micrograms (300 units) / dose  (5 drops).	All children's centres in Sheffield now sell Healthy Start vitamins. They are also available from some pharmacies.  Free from soya and peanut residues  All breastfed babies will receive their first free two month supply from their healthy visitor upon their 14 day visit.  All bottle fed babies will receive a voucher from their health visitor once they are on less than 500mL of infant

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		wholesalers	eligible. However see 'other considerations' (£2.10/bottle/ 2 month supply).		<p>formula to obtain their first free two month supply</p> <p>All children classed as at risk of vitamin D deficiency will have been identified by their GP or health visitor. A sticker in their red book will identify those at risk. These children will be able to obtain free Healthy Start Vitamins from Children's centres up to until the child's fourth birthday.</p> <p>Note from SACN report- <i>There is insufficient data to set RNIs for infants and children aged under 4y. As a precaution, a 'Safe Intake' of vitamin D is recommended for these ages: in the range 8.5-10 micrograms/d (340-400 units/d) for ages 0 up to 1y (including exclusively breast fed and partially breast fed infants, from birth); and 10 micrograms/d (400 units/d) for ages 1 up to 4y.</i> It is acknowledged that Healthy Start vitamin drops contains 7.5 micrograms/300units per dose, however the use of Healthy Start vitamins alongside safe sun exposure and dietary vitamin D intake / advice is first choice in Sheffield for children up to the age of 4 years. Self-care with OTC preparations are advised for older children.</p>
<p>Dalivit (25ml or 50ml bottles).</p> <p>Multivitamin preparation</p> <p>Licensed</p>	Ergocalciferol 400 units per 0.6 ml	Via all wholesalers	£6.19/25ml; £10.58/50ml – OTC prices	<b>6 weeks-1year</b> – 5micrograms (200 units) - 0.3ml (7drops)	<p>Can be added to squash, juice, milk or jam for ease of administration.</p> <p>Does not contain peanut oil or soya</p> <p>Contains 5000 units/14 drops (0.6ml) of vitamin A - Advise patients not to exceed the stated dose. When using this multivitamin preparation, they should also take</p>

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product.				daily <b>≥ 1 year</b> 10micrograms (400 units) - 0.6ml - 14 drops daily	into consideration vitamin A that is obtained from the diet, in order to prevent excessive intake
Abidec (25ml)  Multivitamin preparation  Licensed product.	Ergocalciferol 400 units per 0.6 ml	Via all wholesalers	£5.14/25ml – OTC price	<b>Birth - 1year</b> - 5micrograms (200 units) – 0.3ml (7drops) daily  <b>≥ 1 year</b> 10micrograms (400 units) - 0.6ml -14 drops daily	Contains peanut oil. Contraindicated in patients with a peanut allergy. Also avoid in patients with a soya allergy.
Invita D <sub>3</sub> 2,400 units/ml oral drops, solution (POM)	Colecalciferol - 2,400 units/ml ) - 1 drop contains 1.67 microgram	Via all wholesalers	£4.45/10ml (POM – NHS price)	Prevention of deficiency 0-1 years 10micrograms(400	An olive oil based solution.  D3 is sourced from lanolin from sheep's wool-company confirmed product suitable for vegetarians.  Gelatin-free, PEG-free, peanut oil free

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	coleciferol, equivalent to 67 units vitamin D3.			units)/day (6 drops)  Prevention of deficiency 1-18 years 600 units/day (9 drops)	
Adcal - D <sub>3</sub> caplets  Contains calcium and vitamin D	Caplets – colecalciferol 200 units/caplet (and 300mg calcium)	Via all wholesalers	£2.95/28 days supply (NHS price)	Caplets – Two daily (only licensed in children above 12 years)	Some calcium-containing preparations are poorly tolerated so consider compliance. Dietary adjustment is often a better way to increase calcium intake than supplementation – See Appendix 2

\*correct in April 2017

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## Appendix 2.

### Dietary reference values for calcium.

Age	Reference nutrient intake for calcium Mg/day (mmol/day)
0-12 months	525 (13.1)
1-3 years	350 ( 8.8)
4-6 years	450 (11.3)
7-10 years	550 (13.8)
11-14 years, male	1000 (25.0)
11-14 years , female	800 (20.0)
15-18 years, male	1000 (25.0)
15 -18 years, female	800 (20.0)

Note: 1 mmol calcium = 40 mg calcium.

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## Calcium-rich foods

Find calcium-rich foods from this list for a bone-healthy diet<sup>(1)</sup>. Serving sizes are based on average portions<sup>(2)</sup>.

Food	Serving Size (average)	Calcium (mg)
<b>Milk</b>		
Milk, semi-skimmed	glass, 200 ml	240
Milk skimmed	glass, 200 ml	244
Milk whole	glass, 200 ml	236
Milkshake	takeaway, 300 ml	387
Soy drink, calcium enriched	glass, 200 ml	178
<b>Yoghurt and Cream</b>		
Yoghurt, low-fat, fruit	pot, 150 g	210
Yoghurt, low-fat, plain	pot, 150 g	243
Cream, double, whipped	portion, 45 g	26
Cream single	tablespoon, 15 g	13
<b>Cheeses</b>		
Danish blue	portion, 40 g	195
Edam	portion, 40 g	318
Feta	portion, 40 g	144
Camembert	portion, 40 g	94

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<b>Food</b>	<b>Serving Size (average)</b>	<b>Calcium (mg)</b>
Cheddar	medium chunk, 40 g	296
Cheese spread	portion, 30 g	149
Cottage	small pot, 112 g	142
Mozzarella, fresh	portion, 56 g	203
Parmesan, fresh	portion, 30 g	308
<b>Vegetables</b>		
Broccoli, boiled	serving, 85 g	34
Watercress, raw	small bunch, 20 g	34
Curly Kale	serving, 95 g	143
Okra, stir fried	8 medium, 40 g	88
Red kidney beans, canned	3 tablespoons, 105 g	75
Chick peas, boiled	3 tablespoons, 90 g	41
Green/French beans	serving, 90 g	50
Baked beans	serving, 135 g	72
<b>Nuts</b>		
Almonds	12 whole, 26 g	62
Brazil Nuts	6 whole, 20 g	34
Hazlenuts	20 whole, 20 g	28
Sesame seeds	1 tablespoon, 12 g	80

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<b>Food</b>	<b>Serving Size (average)</b>	<b>Calcium (mg)</b>
Walnuts	12 halves, 40 g	38
Tahini Paste	1 heaped teaspoon, 19 g	129
<b>Desserts</b>		
Cheesecake, fruit	average slice, 120 g	94
Custard made with milk	average portion, 120 g	166
Rice pudding, canned	average portion, 200 g	176
Ice cream, dairy, vanilla	average serving, 75 g	75
Fromage frais, fruit	small pot, 60 g	52
<b>Fish</b>		
Sardines in oil, tinned	portion, 100 g	500
Whitebait, fried	portion, 80 g	688
Salmon, tinned	average portion, 100 g	91
Fish paste	small jar, 35 g	98
<b>Breads and grains</b>		
Pasta, plain, cooked	portion, 230 g	85
Rice, white, boiled	portion, 180 g	32
White bread	slice, 30 g	53
Wholemeal bread	slice, 30 g	32

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<b>Food</b>	<b>Serving Size (average)</b>	<b>Calcium (mg)</b>
Muesli, Swiss style	portion, 50 g	55
<b>Fruits</b>		
Apricots, raw, no stone	4 fruit, 160 g	117
Figs, ready to eat	4 fruit, 220 g	506
Currants	2 tablespoons, 50 g	47
Orange	peeled, 160 g	75
<b>Other foods</b>		
Tofu, soy bean, steamed	100 g	510
Omelette, cheese	2 eggs, 120 g	344
Quiche, cheese & egg	average slice, 140 g	367
Macaroni cheese	portion, 220 g	374
Pizza, cheese & tomato	9" - 10" pizza, 410 g	873
Lasagne	portion, 420 g	420

## References:

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Original document was prepared by: Paul Arundel - Consultant in Paediatric Metabolic Bone Disease, Sheffield Children’s Hospital and Heidi Taylor – Clinical Effectiveness Pharmacist, Medicines Management Team, NHS Sheffield. With appreciated support and guidance from Richard Oliver – Sheffield NHS CCG, Nick Bishop – Professor of Paediatric Bone Disease, Sheffield Children’s Hospital, Chris Rudd, Dietetic advisor, MMT and Trish Evans, GP – Page Hall.

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