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| Title: Vitamin D Deficiency in Children and Young People | | | |
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| **Approved by:** | P&N D&T | | |
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| **Target Audience:** | General Paediatrics, General Practice | | |
| **Supersedes:** | Investigation and Management of Children and Adolescents with Vitamin D Deficiency | | |
| **Keywords (min. 5):** | Vitamin D Deficiency, Rickets, Vitamin D, hypocalcaemia, alkaline phosphatase, phosphate | | |

Version Control

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| **Date** | **Author** | **Version/Page** | **Reason for change** |
| December 2015 | D. Ellis | INVESTIGATION AND MANAGEMENT OF CHILDREN AND ADOLESCENTS WITH VITAMIN D DEFICIENCY | New recommendations for investigation and formulary updated |
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1. Purpose

To provide guidance to clinicians on who to investigate for vitamin D deficiency.

How to manage proven vitamin D deficiency.

1. Scope

Clinicians in primary and secondary care in NHS Lothian who look after children and young people with suspected or proven vitamin D deficiency.

1. Definitions

25-OH vitamin D is the standard vitamin D level checked.

Colecalciferol is the pharmacological name for vitamin D.

1. Main content

**Who should get vitamin D supplementation?**

The UK Scientific Advisory Committee on Nutrition recommends that **everybody in the UK population** should take a daily 400 unit vitamin D supplement.

**Who should I check a vitamin D level on?**

|  |  |
| --- | --- |
| **Characteristics** | **Management** |
| No risk factors | No investigations.  Lifestyle advice and supplementation |
| Risk factors & no symptoms  (Appendix 1) | No investigations.  Lifestyle advice and supplementation |
| Symptoms and signs of vitamin D deficiency (Appendix 2) | Investigations & management flow chart |

**Investigations:**

* **25-OH vitamin D** (Result takes 3-5 weeks)
* **Calcium, phosphate, U&Es and creatinine, LFTs, ferritin, FBC and PTH** (iron deficiency anaemia and vitamin D deficiency often co-exist)
* **Left wrist x-ray** (specify ?rickets)
* **Plot height & weight** (and OFC if <2 years)

**Biochemical presentation of Vitamin D deficiency:**

* 25-OH vitamin D - low
* Calcium - normal or low
* Phosphate – normal or low
* Alkaline phosphatase (ALP) – normal or high
* PTH – normal or high

**Who to refer:**

* Normal vitamin D level and abnormal biochemistry or presence of rickets – discuss with ENDOCRINE
* Elevated urea or creatinine – discuss with RENAL
* Elevated liver enzymes or suspected GI malabsorption – discuss with GI

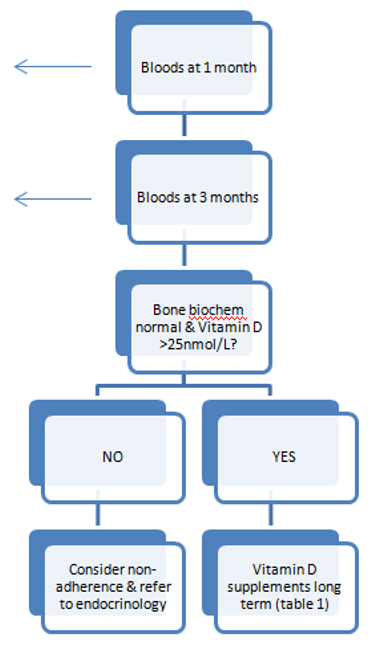
**Flow Chart 1**

**Management of Vitamin D deficiency:**

**Flow chart 2**

**Monitoring (for patients with proven vitamin D deficiency commenced on colecalciferol AND calcium)**

**If any deviation from the expected course contact endocrine team.**

****

**Vit D and bone biochemistry (calcium, phosphate, LFTS, PTH)**

**Check calcium, phosphate & LFTS:**

* If calcium and ALP normal then stop calcium supplements
* If calcium low or phosphate low or ALP high - refer to endocrinology

**Formulary**

**Vitamin D supplements:**

NOTE: 40 units = 1 microgram (400 units = 10 microgram)

**Over the counter vitamin D**

Over the counter vitamin preparations have variable amounts of vitamin D. Parents should be advised to look for those containing 400 units (10 micrograms) vitamin D which are suitable for the age of the child.

**Prescription vitamin D supplements (Table 1)**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Age** | **Preparation** | **Dose** | **Frequency** | **Amount** | **Notes** |
| Birth to 5 years | Healthy start vitamin drops | 400 units | Daily | 5 drops | Free to eligible families |
| Birth to  18 years | Abidec® or Dalivit® | 400 units | Daily | 0.6ml | Abidec contains peanut oil |
| 0 - 1 year | Invita D3® oral drops | 400 units | Daily | 6 drops |  |
| 1 – 18 years | Invita D3® oral drops | 600 units | Daily | 9 drops |  |
| 0 – 1 year | Invita D3®  ampoule | 25,000 units | 8-weekly | 1 ampoule | Pour ampoule contents directly into child’s mouth or mix with a small drink e.g. milk |
| 1 – 18 years | Invita D3®  ampoule | 25,000 units | 6-weekly | 1 ampoule |
| 12 – 18 years | Colecalciferol  tablets/  capsules | 800 units | Daily | 1 tablet/  capsule | Tablet can be  crushed and mixed with  water. |
| 12 – 18 years | Colecalciferol  capsule | 20,000 units | 6-weekly | 1 capsule |  |

**Vitamin D deficiency treatment:**

**Colecalciferol treatment (Table 2):**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Age** | **Preparation** | **Dose** | **Frequency** | **Length of course** |
| 0 – 18 years | Invita D3® **ampoule** | 25,000 units | 2-weekly | 1 dose taken at 0, 2, 4 and 6 weeks (4 doses in total) |
| 12 – 18 years | Invita D3®**capsules** | 20,000 units | 2-weekly | 1 dose taken at 0, 2, 4 and 6 weeks  (4 doses in total) |

**Alternative Ergocalciferol treatment (single stat dose for those in whom compliance could be an issue):**

IM Ergocalciferol 300,000 units IM stat (can be repeated 3 monthly)

**Calcium supplements (Table 3):**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Age** | **Preparation** | **Dose** | **Frequency** | **Notes** |
| 1 month – 4 years | Calvive® 1000 effervescent tablets (25mmol) | 0.25mmol/kg | 4 times a day | Dissolve one (25mmol) tablet in 25ml water = 1mmol/ml |
| 5 – 12 years | Calvive® 1000 effervescent tablets (25mmol) | 0.2mmol/kg | 4 times a day (max 40mmol/day) | Dissolve one (25mmol) tablet in 25ml water = 1mmol/ml |
| 12 – 18 years | Calvive® 1000 effervescent tablets (25mmol) | 12.5mmol | 3 times a day | Dissolve one (25mmol) tablet in 25mls water = 1mmol/ml and give 12.5ml |
| 12 – 18 years | Calcichew®  Calcium carbonate 500mg (12.5mmol) | 12.5mmol | 3 times a day | Take 1 tablet 3 times a day. Suck or chew. |

1. Associated materials

Appendix 1:

Risk factors for vitamin D deficiency:

Increased need:

* Infants

Reduced sun exposure:

* Season (Oct – March in Scotland)
* Dark skin
* Concealing clothing
* Immobility
* Excessive use of sun block
* Chronic health condition that reduces time outdoors

Limited Diet:

* Vegetarians and vegans
* Prolonged breastfeeding – even if mother has sufficient vitamin D
* Exclusion diets e.g. milk allergy
* Malabsorption
* Liver disease
* Renal disease
* Some drugs e.g. anticonvulsants, anti-Tuberculosis drugs

Appendix 2:

Symptoms and signs of vitamin D deficiency:

* Bone pain
* ‘Growing pains’
* Muscle weakness
* Gross motor delay
* Poor growth
* Dental caries
* Symptoms of hypocalcaemia (seizures, tetany)
* Rickets (thickened wrists, genu varum, genu valgum, rachitic rosary, pectus carinatum, kyphoscoliosis, craniotabes, frontal bossing)
* Radiological features of rickets
* Bone biochemistry abnormalities found on incidental testing (e.g. incidental raised ALP)

Resources:

**Professionals leaflet**:

Vitamin D information for health professionals in Scotland (NHS Scotland)

<https://www.gov.scot/binaries/content/documents/govscot/publications/advice-and-guidance/2017/11/vitamin-d-recommendations-infants-information-health-professionals-9781786528506/documents/00527986-pdf/00527986-pdf/govscot%3Adocument/00527986.pdf>

**Patient leaflet:**

Vitamin D and you (NHS Scotland)

<http://www.healthscotland.com/documents/5274.aspx>

1. Evidence base

NICE Vitamin D deficiency in children

Scottish Paediatric Endocrine Group Management of nutritional vitamin D deficiency in children and adolescents

RCPCH vitamin D for infants, children and young people

1. Monitoring and review

Review date April 2025