

# PHARMACY Bulletin






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## Vitamin D Deficiency

- Vitamin D deficiency is the most common nutritional deficiency worldwide in both children and adults.<sup>1</sup>
- In the US and Europe, >40% of the adult population >50 years of age is vitamin D-deficient.<sup>2</sup>
- In Malaysia, prevalence of vitamin D deficiency among children and adolescents is high.<sup>3</sup>
- Vitamin D deficiency still occurs with the consumption of unfortified foods, especially in the setting of limited sunlight exposure.<sup>1</sup>
- A combination of sensible sun exposure along with adequate vitamin D supplementation for all children and adults will prevent vitamin D deficiency/insufficiency in the general population.
- In order to obtain the maximum benefit of vitamin D for overall health and wellbeing, children and adults should have a level of serum 25-hydroxyvitamin D of **>30 ng/mL**.





### Risk Factors

-  Inadequate Exposure to Sunlight
-  SPF30 Reduces Vitamin D Production by 99 %
-  Age Above 65 Years Old
-  Obese BMI > 30kg/m<sup>2</sup>
-  Darker Skin Tone

### Clinical Importance<sup>4</sup>

- Cardiovascular Health
- Muscle Health
- Neurodevelopment
- Immunomodulation
- Regulate Cell Growth and Differentiation

### Vitamin D is proven to:<sup>5</sup>

-  Reduce Risk of Falls
-  Reduce Osteoporotic Fracture
-  Reduce Risk of Type 2 Diabetes
-  Reduce Risk of Cardiovascular Events in Patients with Hypertension
-  Reduce Risk of Colon Cancer
-  Reduce Incidence of Breast Cancer

### Primary Prevention

#### Recommended Dietary Allowance (RDA) of Vitamin D:<sup>6</sup>

0-12 months old	400IU/day
1 year and older	600IU/day

#### Common Sources of Vitamin D:

Salmon, sardine, tuna, cod liver oil, egg yolk, shiitake mushroom, sunlight, fortified milk, fortified yogurts, fortified butter, fortified cheeses, fortified breakfast cereals, sunlight/UVB radiation.

### Secondary Prevention

- Once the desired serum level of vitamin D is obtained, daily oral vitamin D maintenance doses are initiated and should be continued for life to prevent a recurrence.
- Outdoor sensible sun exposure 2 to 3 times a week should be recommended.

1. BMJ Best Practice Vitamin D Deficiency (Updated 14 July 2018)
2. Hossein-Nezhad A, Holick MF. Vitamin D for health: a global perspective. Mayo Clin Proc. 2013 Jul;88(7):720-55.
3. Al-Sadat N, et al. Vitamin D deficiency in Malaysian adolescents aged 13 years: findings from the Malaysian Health and Adolescents Longitudinal Research Team study. BMJ Open 2016;6:e010689.
4. Hollis BW, Wagner CL. Nutritional vitamin D status during pregnancy: reasons for concern. CMAJ. 2006 Apr 25; 174(9): 1287-1290.
5. Bordelon P, Ghetu MV, Langan R. Recognition and Management of Vitamin D Deficiency. Am Fam Physician. 2009 Oct 15;80(8):841-846.
6. Holick MF, Binkley NC, Bischoff-Ferrari HA, et al. Evaluation, treatment and prevention of vitamin D deficiency: an Endocrine Society clinical practice guideline. J Clin Endocrinol Metab. 2011 Jul;96(7):1911-30.

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(Drug Formulary DIY)



(PPUKM Drug Formulary)



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PDF version available at <https://www.ppukm.ukm.my/farmasi/>

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# Vitamin D Preparation in HCTM for Various Indications

Alternatives	Status	Pharmacokinetic	Dosage
<b>Blackmores Vitamin D3 1000 IU Capsule</b> 	<b>Formulary</b>  <b>Prescriber:</b> Pediatricians only  <b>Price:</b> RM53.40/60 caps	<b>Hepatic</b> metabolism to 25 (OH) vitamin D, then <b>renal</b> metabolism to active compound 1,25 (OH) <sub>2</sub> Vitamin D  *Should not be used with calcium in patients with renal impairment  *No dosage adjustment mentioned in patients with hepatic impairment	<b>Active ingredient:</b> 0.025 mg Cholecalciferol (equivalent to 1000 IU of Vitamin D3)  <b>Dosages:</b> <b><u>Pediatrics</u></b> For treatment and prevention of Vitamin D deficiency • Children under 12 years: As professionally prescribed. <b><u>Adults</u></b> • For treatment and prevention of Vitamin D deficiency: 1-2 capsules a day with a meal, or as professionally prescribed. • For adjuvant treatment for osteoporosis: 1-2 capsules a day with a meal, or as professionally prescribed.
<b>D-Cure® 25,000 IU Oral Solution</b> 	<b>Non-Formulary</b>  <b>Price:</b> RM31.70/4 ampoules	<b>Contraindication:</b> Hypercalcemia Hypercalciuria Nephrolithiasis Serious renal impairment Pseudohypoparathyroidism Hypervitaminosis D	<b>Active ingredient:</b> 0.625 mg Cholecalciferol (equivalent to 25,000 IU of Vitamin D3)  <b>Dosages:</b> <b><u>Pediatrics</u></b> • Prevention of deficiency 0-1 years: 25000 IU every 8 weeks • Prevention of deficiency 1-18 years: 25000 IU every 6 weeks • Treatment of deficiency 0-18 years: 25000 IU once every 2 weeks for 6 weeks (followed by maintenance therapy of 400-1000 IU/day) <b><u>Adults</u></b> • Prevention of vitamin D deficiency: 25000 IU/month (1 single-dose oral solution) • Treatment of vitamin D deficiency (<25 ng/ml): 50000 IU/week for 6-8 weeks, followed by maintenance therapy of 1400-2000 IU/day • As an adjunct to specific therapy for osteoporosis: 25000 IU/month
<b>Osteocap 0.25 µg Capsule</b> 	<b>Formulary</b>  <b>Prescribers:</b> Endocrinologists, Nephrologists, ENT, Pediatric Specialists, O&G Specialists and Rheumatologists  <b>Price:</b> RM28.50/100 caps	Active. Conversion is not required  <b>Contraindication:</b> Hypercalcemia, Vitamin D toxicity	<b>Active ingredient:</b> 0.25µg Calcitriol  <b>Dosages:</b> • Treatment of renal osteodystrophy: start with 1 capsule daily. After 2-4 weeks, may start increasing your dose slowly by 0.25 µg at a time based on serum calcium level. • Treatment of postmenopausal osteoporosis: 1 capsule twice daily with monitoring of serum calcium and creatinine level.
<b>Alfacalcidol Capsule 0.25 µg &amp; 1 µg</b>  <b>Drops 2mcg/ml</b>  <b>Injection 2 mcg/ml</b> 	<b>Formulary</b>  <b>Prescribers:</b> <b>Cap. &amp; Inj. :</b> Endocrinologists, Nephrologists, O&G Specialists, Orthopedic, Rheumatologists, Surgery (Post thyroidectomy) and Pediatrics. <b>Drop:</b> Endocrinologists, Nephrologists, ENT & Pediatrics  <b>Price:</b> <b>Cap. 0.25 µg :</b> RM24.30/100 caps <b>Cap. 1 µg :</b> RM80.40/100 caps <b>Drop:</b> RM 262.60/20ml bottle <b>Injection:</b> RM 13.90/ 0.5ml inj.	A prodrug, <b>hepatic</b> metabolism to Calcitriol  <b>Contraindication:</b> Hypercalcemia	<b>Active ingredient:</b> 0.25µg Alfacalcidol  <b>Conversion:</b> 1 drop = 0.1 µg  <b>Initial dose for all indications:</b> <b><u>Paediatrics</u></b> • Neonates: 0.05-0.1 µg/kg/day. • Children < 20 kg: 0.05 µg/kg/day. • Children > 20 kg: 1 µg/day. <b><u>Adults</u></b> • Usual starting dose: 1 µg/day. The dose may be adjusted by increment of 0.25-0.5 µg. Most people respond to doses between 1-3 µg/day. <b><u>Elderly</u></b> • Usual starting dose: 0.5 µg/day.