Vitamin D Practice Guidelines

OSTEOS
Lebanese Society for Osteoporosis & Metabolic Bone Disorders

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Vitamin D Intakes Recommended by the IOM and the Endocrine Practice Guidelines Committee / Pediatrics

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		Desirable 20 ng/ml IOM recommendations			Desirable 30 ng/ml ES Recommendations at risk for D deficiency	
Life stage group	AI	EAR	RDA	UL	Daily requirement	UL
Infants						
0 to 6 months	400 IU (10g)			1,000 IU(25 µg)	400–1,000 IU	2,000 IU
6 to 12 months	400 IU (10 g)			1,500 IU(38 µg)	400–1,000 IU	2,000 IU
Children						
1–3 yr		400 IU (10 µg)	600 IU(15 µg)	2,500 IU(63 µg)	600–1,000 IU	4,000 IU
4-8 yr		400 IU (10 µg)	600 IU(15 µg)	3,000 IU(75 µg)	600–1,000 IU	4,000 IU
9-13 yr		400 IU (10 µg)	600 IU(15 µg)	4,000 IU(100 µg)	600–1,000 IU	4,000 IU
14- 18 yr		400 IU (10 µg)	600 IU(15 µg)	4,000 IU(100 µg)	600–1,000 IU	4,000 IU

Institute of Medicine (IOM) Ross et al. J Clin Endocrinol Metab 96: 53–58, 2011
Endocrine Society (ES) Holick et al. J Clin Endocrinol Metab 96 (7):1-, 2011

Vitamin D Intakes Recommended by the IOM and the Endocrine Society (ES) Practice Guidelines Committee / Pregnancy and Lactation

	IOM recommendations			ES recommendations for patients at risk for vitamin D deficiency	
Life stage group	**EAR**	**RDA**	**UL**	**Daily**	**UL**
Pregnancy					
14-18 yr	400 IU (10 µg)	600 IU (15 µg)	4,000 IU (100 µg)	600–1,000 IU	4,000 IU
19- 30 yr	400 IU (10 µg)	600 IU (15 µg)	4,000 IU (100 µg)	1,500–2,000 IU	10,000 IU
31-50 yr	400 IU (10 µg)	600 IU (15 µg)	4,000 IU (100 µg)	1,500–2,000 IU	10,000 IU
Lactation	400 IU (10 µg)	600 IU (15 µg)	4,000 IU (100 µg)		
14-18 yr	400 IU (10 µg)	600 IU (15 µg)	4,000 IU (100 µg)	600–1,000 IU	4,000 IU
19- 30 yr	400 IU (10 µg)	600 IU (15 µg)	4,000 IU (100 µg)	1,500–2,000 IU	10,000 IU
31-50 yr	400 IU (10 µg)	600 IU (15 µg)	4,000 IU (100 µg)	1,500–2,000 IU	10,000 IU

Vitamin D intakes Recommended by the Practice Guidelines Committee / Adults

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	IOM recommendations			ES recommendations for patients at risk for vitamin D deficiency	
Life stage group	**EAR**	**RDA**	**UL**	**Daily**	**UL**
Adults					
19-30 yr	400 IU (10 µg)	600 IU (15 µg)	4,000 IU (100 µg)	1500–2,000 IU	10,000 IU
31-50 yr	400 IU (10 µg)	600 IU (15 µg)	4,000 IU (100 µg)	1,500–2,000 IU	10,000 IU
51-70 yr	400 IU (10 µg)	600 IU (15 µg)	4,000 IU (100 µg)	1,500–2,000 IU	10,000 IU
> 70 yr	400 IU (10 µg)	600 IU (20 µg)	4,000 IU (100 µg)	1,500–2,000 IU	10,000 IU

Lebanese Osteoporosis Guidelines 2003 and 2007Universal Recommendations

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- Maintain a physically active lifestyle with adequate exposure to sunlight
- Avoid smoking and high alcohol intakes
- Maintain dietary calcium intake around 1.5 gm of elemental calcium in PM estrogen deficient women or men >65 years and vitamin D intake of 600 to 800 IU/day
- Provide calcium and vitamin D supplementation in the elderly

http://www.osteofound.org/health_professionals/guidelines/guidelines_list.html

Lebanese Osteoporosis Guidelines 2003 and 2007
Universal Recommendations

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- Avoid a low weight <60 kg in men or 50 kg in women or a low Body Mass Index BMI<20 kg/m2.

- The prevention of osteoporosis begins with optimal bone mass acquisition during growth. Factors hindering bone mass acquisition, such as malnutrition and inadequate Calcium or Vitamin D intake, should be considered, identified and addressed during childhood.

- Address known factors that stimulate bone resorption or inhibit bone formation, including hypogonadism, primary hyperparathyroidism, hyperthyroidism and hypercortisolism.

- Develop fall prevention awareness and programs in the elderly.

- Hip protection and/or soft floor covering in elderly environment.

Lebanese Osteoporosis Guidelines 2012

- Elemental calcium at 1200 mg/day
  - Intake > 1500 mg/day has limited benefit and may increase risk of kidney stones or CV disease
- Vitamin D3 800-1000 IU/day
  - Many patients will need more to achieve serum 25-OH-D level of 30 ng/ml or higher
- Regular weight-bearing exercise
- Fall prevention
- Avoid tobacco use and excess alcohol intake

Lebanese Vitamin D Practice Guidelines 2013

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- To most consistently improve clinical outcomes such as fracture risk, fall risk and minimize bone loss an optimal serum level of 25-hydroxyvitamin D is probably above 75 nmol/L (30 ng/ml**)-Desirable Range 30-60 ng/ml**

- For most Lebanese supplementation is needed to achieve this level.

- Exposure to natural sunlight, when used in moderation (avoiding sunburn), can contribute to vitamin D sufficiency in the summer in subjects who do seek such exposure

- The recommended vitamin D intake is 15–25 µg (600–1000 IU) daily for children-adolescents and low-risk adults under 50 years of age, and 20–50 µg (1000–2000 IU) for high-risk and older adults, with potential for consideration of higher doses.

- Doses up to 50 µg (2000 IU) are safe and do not require monitoring, but if higher doses are sometimes needed, monitoring is appropriate.

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- Serum 25-hydroxyvitamin D should NOT be measured in routine practice
- It should be measured in following instances:
- High risk individuals: such as those with osteoporosis on pharmacologic therapy, with fractures
- Conditions known to affect vitamin D metabolism or action
  - Steroids, anticonvulsants, malabsorption, by-pass surgery, cirrhosis (need to order both 25-D and 1,25D level), patients with high PTH levels
- In individuals on doses > 2000 IU /day

Lebanese Vitamin D Practice Guidelines 2013

- Once a stable dose-level are reached routine monitoring of 25-OHD level is not recommended
- Recommend using a laboratory with rigorous QA measures (See technical recommendations and guide Dr Daher)
- Recommend against using 1,25 $(OH)_2$ D except in select conditions: such as disorders of vitamin D and P04 metabolism.
- Research is needed on impact of low D levels on multiple non-classical outcomes

Hypovitaminosis D in EMR

- **Hypovitaminosis D is strikingly common in "apparently healthy" individuals, lowest levels are in the Middle East-silent precursor of NCDs**
  - Predictors age, gender, veiling, season, parity, SES
  - Genetic polymorphisms in metabolic pathway may contribute: CYP21R

- **This has a negative impact on musculoskeletal health**
  - Vit D status inversely correlates with PTH (R=-0.2 to-0.37) and directly with bone mass (R=0.2-0.35)-Elderly with OP have lower 25-OHD, and higher levels of PTH
  - 25-OHD level positively correlates with bone mass
  - RCT show that Ca/D (> 700IU/day) reduce falls and fracture risk.
  - Deleterious impact on maternal & neonatal health is anticipated but not established (*Morley et al. JCEM 2006, Javaid et al. Lancet 2006)*

- **There may be an effect on non-classical outcomes need for RCT**
  - Cardiovascular: for eg Pre-ecclampsia *(Bodnar JCEM 2007)*
  - Insulin resistance & DM including gestational diabetes: *(Pittas Diabetes Care 2007)*
  - Infections and auto-immune disorders
  - Cancer

Bikle D. Non-classic actions of vitamin D J Clin Endocrinol Metabol 2009; 94: 26-
Giovannuci. Expanding roles of vitamin D. J Clin Endocrinol Metabol 2009; 94: 418-

Hypovitaminosis D in EMR

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- **Assay variation somewhat limits comparability across studies and is a major obstacle in advancing field-Need for QA programs**
- **Calcium intake does, and VDR polymorphisms may, modulate effect of hypovitaminosis D on major outcomes**
- **Recommendations in western populations need to be adjusted upwards in Eastern Mediterranean Region**
- **Evidence lacks to define optimal dose in:**
  - pregnant and breast-feeding women, infants, pre-pubertal children and non-classical outcomes worldwide and for the elderly in EMR.
- **Meanwhile, suggest increments in recommended doses**
  - **To achieve desirable 25-OHD level 25-30 ng/ml**