

Parathyroid glands

(2)

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وظيفة: ما هي المقاربة الصحيحة ؟

لمريض لديه بوال وسهاف وحصيات كلوية وعقدة مثبتة للستامبي تحاليله المخبرية

Ca = 9,5 mg/dl (normal: 8.5-10.5)

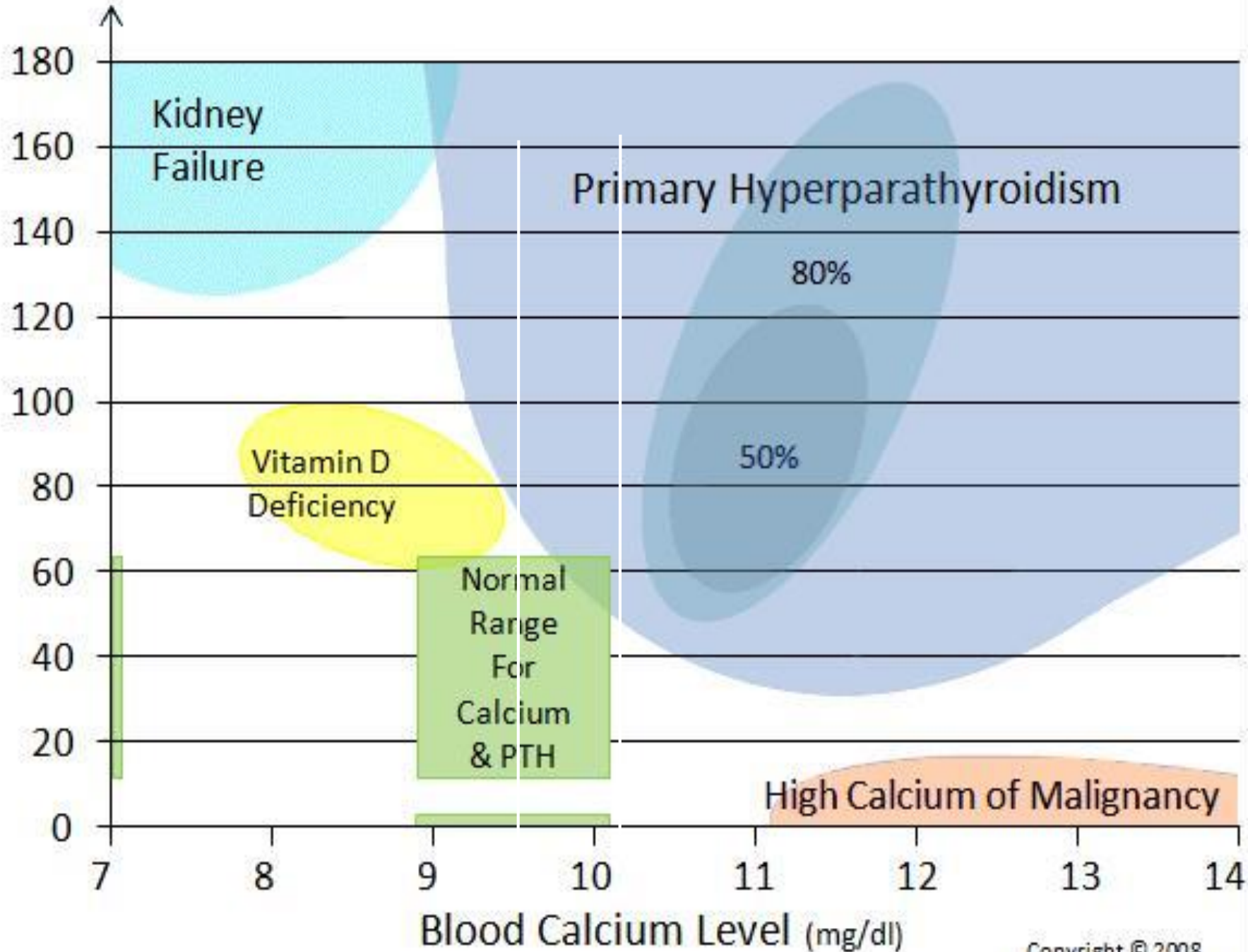
Albumin = 4 g/dl

PTH = 38 pg/ml (normal: 10 – 65)

تتوافق الحالة مع

**Normocalcemic Primary
hyperparathyroidism**

Blood Parathyroid Hormone (PTH) Level



● نقاش حامي الوطيس بين وفاء عن فريق الطالبات وأسامة
عن فريق الطلاب حول تحاليل لفادي (عمره ٢٥ سنة)
أجراها من أجل التوظيف وهي كما يلي: السكر والكرياتينين
والتعداد العام والصيغة الطبيعية لكن الكالسيوم أقل من
الطبيعي

● الكالسيوم = ٨,٤ ملغ/دل (ط ٨,٥ - ١٠)
ما رأيك؟

الكالسيوم المعدّل

الكالسيوم المعدّل = الكالسيوم الحالي + 0.8 (4-الألبومين)

● أثناء تطبيق ما درسه طالب سنة رابعة عن علامات نقص الكلس جرب استقصاء علامة شفوستك على أخيه فكانت ايجابية اضطرب وسأل ما عليه أن يفعل؟

أ- يعاير الكالسيوم في الدم

ب- يعاير هرمون جارات الدرق

ت- يطلب ايكودرق

ث- ؟

The image contains two diagrams illustrating clinical signs of hyperthyroidism. The top diagram shows two individuals. On the left, a person with dark hair is shown with their hand near their face, and the caption below reads "Positive Chvostek's Sign". On the right, a person with blonde hair is shown with their hand near their face, and the caption below reads "Positive Trousseau's Sign". The bottom diagram shows a person's arm with a blood pressure cuff inflated, and the caption below reads "Positive Trousseau's Sign".



Example: fetal position, important for relief of labor pains (see <http://www.wellnesswithajournal.com>)

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Trousseau's Signs

- Chvostek sign: Specificity is low (25 % of normal individuals have a mild Chvostek sign)
- Trousseau sign is more specific (1% to 4% of normal individuals have positive)

Causes of Hypocalcemia

- **Hypoparathyroidism**
 - Surgical/ Idiopathic/ Neonatal
 - Familial/ Autoimmune
 - Deposition of metals (iron, copper, aluminum)
 - Postradiation/ Infiltrative
 - Functional (in hypomagnesemia)
- **Resistance to PTH action**
 - Pseudohypoparathyroidism
 - Renal insufficiency
 - Medications that block osteoclastic bone resorption
 - Plicamycin, Calcitonin, Bisphosphonates
- **Failure to produce $1,25(\text{OH})_2\text{D}$ normally**
 - Vitamin D deficiency
 - Hereditary vitamin D-dependent rickets, type 1 (renal $25\text{-OH-vitamin D } 1\alpha\text{-hydroxylase}$ deficiency)
- **Resistance to $1,25(\text{OH})_2\text{D}$ action**
 - Hereditary vitamin D-dependent rickets, type 2 (defective VDR)
- **Acute hyperphosphatemia**
 - Crush injury with myonecrosis
 - Rapid tumor lysis
 - Parenteral phosphate administration
 - Excessive enteral phosphate
 - Oral (phosphate-containing antacids)
 - Phosphate-containing enemas
- **Acute pancreatitis**
- **Citrated blood transfusion**
- **Rapid, excessive skeletal mineralization**
 - Hungry bones syndrome
 - Osteoblastic metastasis
 - Vitamin D therapy for vitamin D deficiency

Miss L is a 16 year old woman with no significant past medical history, who is brought to the ER by her mother after she noted her to be acting bizarrely for the past several weeks. Thought to be actively psychotic, a psychiatry consult is asked to see the patient, who recommends checking routine labs:

Sodium – 142 meq/L (136–146 meq/L)
Potassium – 4.1 meq/L (3.5–5.0 meq/L)
Magnesium – 2.3 mg/dL (1.5–2.3 mg/dL)
Calcium (total) – 6.9 mg/dL (8.7–10.2 mg/dL)
Phosphate – 4.4 mg/dL (2.5–4.3 mg/dL)
Albumin – 4.2 g/dL
Creatinine – 0.8 mg/dL

- ما هو التشخيص الأرجح مما يلي وما هي الخطوة التالية

أ- داء زلاقي ب- قصور جارات درق كاذب ج- قصور جارات درق كاذب كاذب
د- قصور كلوي هـ- عوز فيتامين د

- ما هي الاجراءات اللازمة للتشخيص؟

Pseudohypoparathyroidism (PHP)

1- **PHP type IB** is a disorder of isolated resistance to PTH: biochemical features of hypocalcemia, hyperphosphatemia, and secondary hyperparathyroidism.

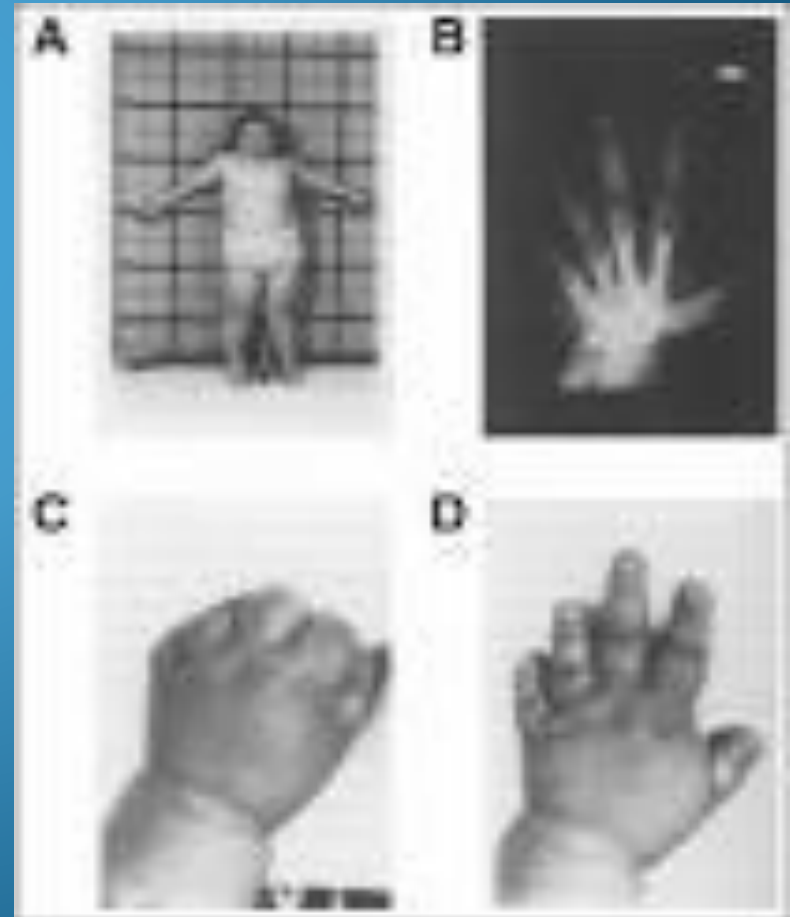
2- **PHP type IA** has, in addition to biochemical features, a characteristic somatic phenotype known as **Albright hereditary osteodystrophy (AHO)**.

Short stature, round face, short neck, obesity, brachydactyly (short digits), shortened metatarsals, subcutaneous ossifications, and often reduced intelligence.

Because of shortening of the metacarpal bones—most often the fourth and fifth metacarpals—affected digits have a dimple, instead of a knuckle, when a fist is made.

Primary hypothyroidism is frequently seen.

Less commonly, these patients have abnormalities of reproductive function—oligomenorrhea in females and infertility in males due to primary hypogonadism.



Pseudo Pseudohypoparathyroidism (PPHP)

Certain individuals in families with PHP inherit the somatic phenotype of AHO without any disorder of calcium metabolism.



● بعد استئصال درق تام حدث لدى المريض نوبة تكرر،
عولجت بالكالسيوم وريدياً وكذلك فمويّاً. تحسن المريض
وطلب منك تخريجه. ما رأيك

Treatment of Hypocalcemia

- **Acute Hypocalcemia**

Patients with tetany should receive **intravenous calcium** as calcium chloride (272 mg calcium/10 mL), calcium gluconate (90 mg calcium/10 mL), or calcium gluceptate (90 mg calcium/10 mL). Approximately 200 mg of elemental calcium can be given over several minutes. The patient must be observed for stridor and the airway secured if necessary.

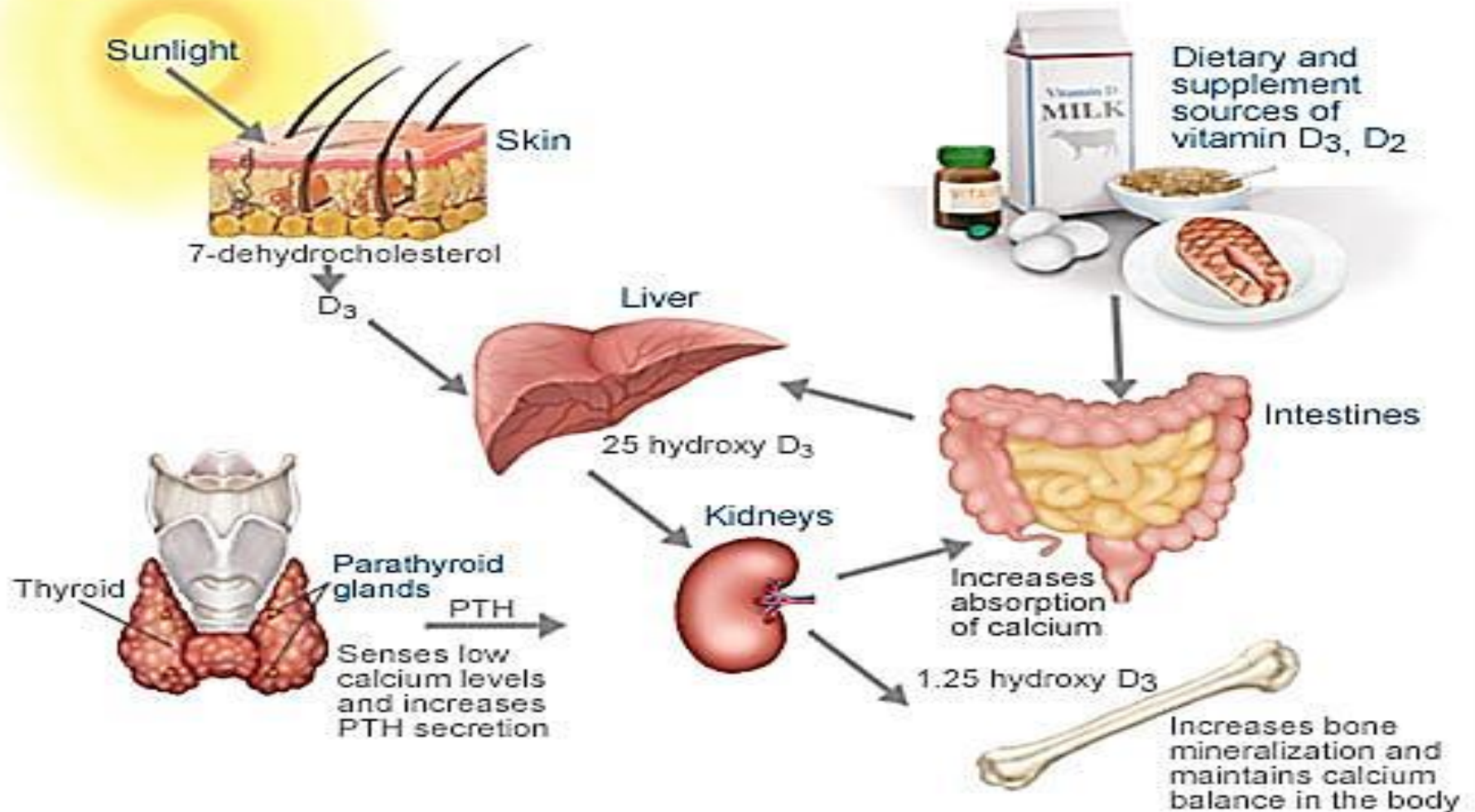
Oral calcium and a rapidly acting preparation of vitamin D should be started. If necessary, calcium can be infused in doses of 400 to 1000 mg/24 h until oral therapy has taken effect.

Intravenous calcium is irritating to the veins and is best infused into a large vein or through a central venous catheter.

Vitamin D Deficiency

Vitamin D synthesis and metabolism

Vitamin D Metabolism



Vitamin D sources :

- Natural sources of vitamin D :

Sun Exposure:

- Ultraviolet (UV) B (290–320) nanometers penetrates uncovered skin and converts cutaneous 7-dehydrocholesterol to previtamin D₃
- The amount of sunlight needed to synthesize adequate amounts of vitamin D varies, depending upon the person's age, sun exposure, season, time of day, length of day, cloud cover, smog, skin melanin content, sunscreen and underlying medical problems.

- Vitamin D promotes calcium absorption in the gut and maintains adequate serum calcium and phosphate concentrations .
- Needed for bone growth and bone remodeling.

Vitamin D has other roles in the body, including modulation of cell growth, neuromuscular and immune function, and reduction of inflammation.

Holick MF. Vitamin D. In: Shils ME, Shike M, Ross AC, Caballero B, Cousins RJ, eds. Modern Nutrition in Health and Disease, 10th ed. Philadelphia: Lippincott Williams & Wilkins, 2006.

Norman AW, Henry HH. Vitamin D. In: Bowman BA, Russell RM, eds. Present Knowledge in Nutrition, 9th ed. Washington DC: ILSI Press, 2006.

Diagnosis of vitamin D deficiency

- A normal level of vitamin D is defined as a 25(OH)D concentration greater than 30 ng/mL (75 nmol/L).
- Vitamin D insufficiency is defined as a 25(OH)D concentration of 20 to 30 ng/mL (50 to 75 nmol/L).
- Vitamin D deficiency is defined as a 25(OH)D level less than 20 ng/mL (50 nmol/L).

Vitamin D deficiency

Causes:

- Lack of vitamin D in the diet, often in conjunction with inadequate sun exposure
- Inability to absorb vitamin D from the intestines
- Inability to process vitamin D due to kidney or liver disease

Groups at risk :

- Breastfed infants
- Older adults
- People with limited sun exposure
- People with inflammatory bowel disease and other conditions causing fat malabsorption
- People who are obese or who have undergone gastric bypass surgery
- Chronic kidney disease.
- Liver disease.

Recommended Dietary Allowances (RDAs) for Vitamin D [1]

Age	Male	Female	Pregnancy	Lactation
0–12 months*	400 IU (10 mcg)	400 IU (10 mcg)		
1–13 years	600 IU (15 mcg)	600 IU (15 mcg)		
14–18 years	600 IU (15 mcg)	600 IU (15 mcg)	600 IU (15 mcg)	600 IU (15 mcg)
19–50 years	600 IU (15 mcg)	600 IU (15 mcg)	600 IU (15 mcg)	600 IU (15 mcg)
51–70 years	600 IU (15 mcg)	600 IU (15 mcg)		
>70 years	800 IU (20 mcg)	800 IU (20 mcg)		

Adequate Intake (AI): established when evidence is insufficient to develop an RDA and is set at a level assumed to ensure nutritional adequacy.

Tolerable Upper Intake Levels (ULs) for Vitamin D

Age	Male	Female	Pregnancy	Lactation
0–6 months	1,000 IU (25 mcg)	1,000 IU (25 mcg)		
7–12 months	1,500 IU (38 mcg)	1,500 IU (38 mcg)		
1–3 years	2,500 IU (63 mcg)	2,500 IU (63 mcg)		
4–8 years	3,000 IU (75 mcg)	3,000 IU (75 mcg)		
≥9 years	4,000 IU (100 mcg)	4,000 IU (100 mcg)	4,000 IU (100 mcg)	4,000 IU (100 mcg)

Tolerable Upper Intake Level (UL): maximum daily intake unlikely to cause adverse health effects

الوظيفة: ملء الجدول التالي

World Health Organization Definition of Bone Mass-Dual-energy X-ray absoeptiometry (DEXA)

Normal bone mass

T score

Low bone mass

T score

Osteoporosis

T score

Established
osteoporosis

T score

شكراً
لإصفاائكم

