

Vitamin D, Calciferol

General:

Vitamin D3 (cholecalciferol) is produced in the skin after sun exposure or can be obtained from fortified food. Vitamin D2 (ergocalciferol) can only be obtained from fortified food and supplements. Both are hydroxylated in the liver to 25-hydroxy-vitamin D (25(OH)D) by the enzyme 25-hydroxylase produced by hepatocytes, and stored until it is needed.

The test for Vitamin D deficiency measures total 25-OH Vitamin D levels, which reflects the supply of all Vitamin D2 and D3 from food, supplements, and its synthesis in the skin by UV light.

25-hydroxy-vitamin D is further hydroxylated in the kidneys by the enzyme 1α -hydroxylase, into two dihydroxylated metabolites, the main biologically active hormone 1,25-dihydroxy-vitamin D (1,25(OH)₂D) and 24R,25(OH)₂D. Renal 1α -hydroxylase is stimulated by either parathyroid hormone or hypophosphatemia.

1,25(OH)₂-Vitamin D will not reflect a Vitamin D deficiency because of its short half-life, therefore 25(OH)D levels give the better indication of actual Vitamin D status.

The following tests are available:

- **Vitamin D Total (for Vitamin D deficiency)**

Indication: nutritive Vitamin D status, hypocalcemia, hypophosphatemia, hypocalciuria, increased alkaline phosphatase, radiological signs of Vitamin D defect, observation of pseudofractures, screening for osteoporosis risk factors, rickety syndromes, liver disorders, anticonvulsive therapy (high consumption of vitamin D by epileptics), monitoring patients with kidney dis-orders, Vitamin D intoxication

Material: 1 ml serum

Stability: 4 days at 2 to 8°C

TAT: same day, FML

Method: ECLIA

Units: ng/ml

Ref.- range: see report

Note: If the patient is taking multivitamins or dietary supplements containing high dose of Biotin (> 5 mg), the patient should stop taking it for at least 24 hours, before

having the blood collection.

- **Vitamin D3, 25-hydroxy-vitamin D3, 25-(OH)-vitamin D3, Cholecalciferol**

General:

The concentration of 25-OH-D3 reflects the supply of vitamin-D from food and its synthesis from the pro-vitamins in the skin by UV light. Deficiency is observed in rickets, restricted sunlight exposure (aged persons, cultural restrictions) or in malabsorption syndromes.

Indication: Nutritive vitamin-D3 status, vitamin D-deficiency (e.g. in hypocalcemia, hypophosphatemia, hypocalciuria, increased alkaline phosphatase, radiologic signs of vitamin-D defect), pseudofractures, screening for osteoporosis risk factors, rickety syndromes, liver disorders, anticonvulsive therapy (high consumption of vitamin-D by epileptics), control in patients with kidney dis-orders, vitamin D-intoxication.

Material: 1 ml serum

TAT: 5 -7 days*

Method: LCMS

Units: µg/l

Ref.- range: 20.0 to 60.0

- **Vitamin D2, 25-hydroxy-vitamin D2, 25-(OH)-vitamin D2, Ergocalciferol**

General:

Ergocalciferol (Vitamin D2) is mostly synthesized by plants. In humans vitamin D2 is metabolically activated like cholecalciferol and has nearly the same effects as vitamin D3, however with a lower binding affinity.

Material: 1 ml serum

TAT: 5-7 days*

Method: LCMS

Units: µg/l

Ref.- range: 1.0 - 12.1

- Vitamin D3, 1,25-dihydroxy-vitamin D3, 1,25-dihydroxycholecalciferol

General:

1,25-dihydroxy D3 is the result of hepatic metabolization and catalytical transformation of 25-OH Vitamin D3 by 1-hydroxylase in the kidney. Together with parathyroid hormone it is important for calcium absorption in the intestine, potassium resorption in the kidneys and calcium mobilization in the bone.

Indication: kidney disorders, sarcoidosis, hypercalcuria of unclear genesis, hyperparathyroidism, therapy monitoring

Material: 1 ml serum

TAT: 7-10 days*

Method: CLIA

Units: pg/ml

Ref.- range: see report

Note: vitamin D over-dosage with hypercalcemia can occur in the therapy of rickets, hypoparathyroidism and secondary hyperparathyroidism with renal failure (renal osteopathia)

For complete list of laboratory test offered at Freiburg Medical Laboratory, please visit <http://www.fml-dubai.com/parameter-listings/>