

Get specific test results for vitamin D-related conditions

Vitamin D is clinically useful to diagnose disorders related to intestinal malabsorption and vitamin D deficiency or intoxication. The 25-Hydroxy vitamin D blood test allows monitoring for therapeutic response in patients being treated for vitamin D-related disorders.

Background

25-Hydroxy vitamin D (25OHD) is the major circulating form of vitamin D and the precursor of the active form (1,25-dihydroxy vitamin D). It has a long half-life, which makes its measurements ideal for assessing a patient's vitamin D level.

Forms of vitamin D

The following two forms of vitamin D are used to fortify foods and are found in over-the-counter supplements:

- Vitamin D₃ (cholecalciferol)—obtained from foods of animal origin and ultraviolet light conversion in the skin.
- Vitamin D₂ (ergocalciferol)—small amounts are obtained from foods of plant origin and used in high potency (50.0001u) formulation for vitamin D deficiency treatments.

Both of these forms are metabolized to their respective 25OHD forms (i.e., 25OHD₃ and 25OHD₂). Therefore, an analytical method that can accurately quantitate both forms is necessary to effectively diagnose and monitor patients who have vitamin D disorders.

Previous methodology

1. Report only total 25OHD.
2. May underestimate 25OHD.¹
3. Method-to-method and lab-to-lab variation.²

Test Code: 17306

CPT Code: 82306

Specimen Requirements: 0.25mL room temperature; serum: 0.15mL minimum

Who to test?

The following individuals are suitable for testing:

- Patients with suspect vitamin D deficiency symptoms such as persistent, non-specific musculoskeletal pain; the elderly; and house-bound individuals.
- Those with suspected toxicity, such as patients with anemia of an obscure origin or unexplained renal disease.³
- People who are already being treated for vitamin D-related disorders.

Liquid chromatography, tandem mass spectrometry (LC/MS/MS)

- Concentrations of both D₃ and D₂ are reported, as well as total 25OHD.
- Sensitive and equally specific for both D₃ and D₂.
- Increased reproducibility of results.

LC/MS/MS methodology

- Extraction via protein precipitation.
- Separation via high-performance liquid chromatography (HPLC).
- Detection and quantitation via tandem mass spectrometry.

Reference range

The reference range for total 25OHD (**20–100 ng/mL**) is based on 25OHD correlation with physiological parameters that include parathyroid hormone concentration and calcium absorption.⁴⁻⁸ The range is **not** based on the distribution of levels in an apparently healthy population. 25OHD₂- and 25OHD₃-specific reference ranges are not available.

Interpretive information

Decreased 25OHD concentrations are an indication of vitamin D deficiency and are associated with hypocalcemia, hypophosphatemia and elevated alkaline phosphatase.

In addition to insufficient intake or production, disorders that are characterized by decreased absorption or excessive loss in the gastrointestinal tract, increased vitamin D metabolism or impaired conversion of vitamin D to 25OHD can cause decreased 25OHD levels (Table 25).

Elevated levels of 25OHD suggest vitamin D intoxication and distinguish this disorder from other hypercalcemia-causing disorders.

Levels vary with exposure to sunlight, peaking in the summer months.

Table 25-Hydroxy vitamin D Concentration in Various Disorders⁹⁻¹¹

| Disorder | 25OHD Concentration |
|---|---------------------|
| Vitamin D intoxication | ↑ |
| Nutritional rickets | ↓ |
| Osteomalacia | ↓ |
| Secondary hyperparathyroidism | ↓ |
| Fat malabsorption disorders, short bowel syndrome | ↓ |
| Intestinal diseases causing excessive loss of vitamin D ₂ and D ₃ | ↓ |
| Anti-convulsant or anti-tuberculosis medications (increased metabolism) | ↓ |
| Severe parenchymal liver disease (impaired 25-hydroxylation of vitamin D) | ↓ |
| Severe renal disease | N or ↓ |
| Vitamin D-dependent rickets, type I | N or ↑ |
| Vitamin D-dependent rickets, type II | N |

25OHD, 25-hydroxy vitamin D; N, normal.

References

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*The CPT codes provided are based on AMA guidelines and are for informational purposes only. CPT coding is the sole responsibility of the billing party. Please direct any questions regarding coding to the payer being billed.

For additional questions on Vitamin D,
25-Hydroxy and LC/MS/MS, call 1-877-803-1010.