Vitamin D screening

Clinical Policy ID: CCP.1414

Recent review date: 2/2025

Next review date: 6/2026

Policy contains: Vitamin D assay testing, Vitamin D screening, Vitamin D supplementation.

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Coverage policy

Routine 25-hydroxyvitamin D assay testing or preventive screening is investigational/not clinically proven, and therefore, not medically necessary to guide decision-making or dosing in members ages 19 or older who do not have established indications for 25-hydroxyvitamin D testing, including those who are pregnant, have dark complexion, or are obese. In these populations, empiric vitamin D supplementation should generally proceed without testing, provided that vitamin D dosages are within tolerable upper intake levels established by the Institute of Medicine (2011) (Endocrine Society [Demay, 2024]).

Annual screening for vitamin D deficiency is investigational/not clinically proven and, therefore, not medically necessary in pediatric members who are not at risk for vitamin D deficiency (American Academy of Pediatrics, 2017).

Annual screening for vitamin D deficiency using the 25-hydroxyvitamin D assay is clinically proven and, therefore, may be medically necessary for members who exhibit any sign or symptom of vitamin D deficiency or for asymptomatic members who are at increased risk for vitamin D deficiency, defined as having one or more of the following conditions, when results will be used to institute more aggressive therapy (American Academy of Pediatrics, 2017; American College of Obstetrics and Gynecology, 2024; Holick, 2011):

- Chronic kidney disease stage III or greater.
- Cirrhosis/chronic liver failure.

- Hypercalcemia.
- Hypercalciuria.
- Hypervitaminosis D.
- Hypocalcemia.
- Long-term use of medications known to lower vitamin D levels (e.g., antiseizure drugs, antifungals, glucocorticosteroids, cholestyramine, and drugs for acquired immunodeficiency syndrome/human immunodeficiency virus).
- Malabsorption states.
- Obstructive jaundice.
- Osteomalacia.
- Osteoporosis if either:
    - T score on dual energy x-ray absorptiometry scan < -2.5.
    - History of fragility fractures.
    - Fracture risk assessment tool > 3% 10-year probability of hip fracture or 20% 10-year probability of other major osteoporotic fracture.
    - Fracture risk assessment tool > 3% (any fracture) with T-score < -1.5.
- Initiating bisphosphanate therapy (Vitamin D level and serum calcium levels should be determined and managed as necessary before bisphosphanate is initiated).
- Osteosclerosis/petrosis.
- Parathyroid disorders.
- Rickets.
- Vitamin D deficiency on replacement therapy related to a condition listed above; to monitor the efficacy of treatment.

The serum 1,25 dihydroxyvitamin D assay is clinically proven and, therefore, may be medically necessary for monitoring certain acquired and inherited disorders of vitamin D and phosphate metabolism, including but not limited to (Holick, 2011):

- Unexplained hypercalcemia (suspected granulomatous disease or lymphoma).
- Unexplained hypercalciuria (suspected granulomatous disease or lymphoma).
- Suspected genetic childhood rickets.
- Suspected tumor-induced osteomalacia.
- Nephrolithiasis or hypercalciuria.

Limitations

Performing both assays of vitamin D (25-hydroxyvitamin D and 1,25-dihydroxyvitamin D) is investigational/not clinically proven and, therefore, not medically necessary for each of the above conditions.

Once a member has been shown to be vitamin D deficient, further testing may be medically necessary only to ensure adequate replacement has been accomplished. Thereafter, annual testing may be medically necessary depending on the indication and other mitigating factors.

Alternative covered services

No alternative covered services were identified during the writing of this policy.

Background

Vitamin D is a fat-soluble vitamin ingested through foods, sun exposure, and supplements. It promotes calcium absorption and normal growth of bone. Without adequate levels of vitamin D, bone can become thin, brittle, or misshapen. In addition, the vitamin helps modulate cell growth, enhance neuromuscular and immune function, and reduce inflammation. Vitamin D deficiency can lead to rickets in children and osteomalacia/osteoporosis in adults (National Institutes of Health, 2024).

The National Institutes of Health recommends daily intakes of vitamin D, which vary by age. Persons age 70 and older require 800 international units a day, while infants under age one require just 400 international units a day; persons between ages one and 70 years require 600 international units a day. Foods with the most vitamin D include cod liver oil, certain fishes (sockeye salmon, swordfish, and tuna), orange juice, milk, and yogurt (National Institutes of Health, 2024).

Most Americans age one year and older have sufficient vitamin D intake, yet an estimated 18% are at risk of inadequacy (levels 12 to 19.6 nanogram per milliliter), and 5% are at risk of deficiency (levels below 12 nanogram per milliliter). Breastfed infants, older adults, and people with darker pigmented skin, limited sun exposure, conditions that limit fat absorption, obesity, or a history of gastric bypass surgery are at higher risk of vitamin D inadequacy. Vitamin D supplements may be needed to meet daily requirements and prevent adverse health effects (National Institutes of Health, 2024).

An Institute of Medicine expert panel found vitamin D supplements beneficial for bone, but not for extra-skeletal health. The panel added that any daily supplement > 4,000 international units may lead to possible harm, e.g., hypercalcemia and soft tissue or vascular calcification (Institute of Medicine, 2011).

In the United States from 1999 to 2014, the proportion of adults taking vitamin D supplements has increased. Those taking at least 4,000 units per day rose from 0.2% to 3.2% during this time, which raised concern over potential health risks. Vitamin D testing also increased substantially in the general population, particularly among Americans age 70 and older, prompting a discussion about when this testing is medically necessary (Rooney, 2017).

The main indicator of vitamin D status is serum concentration of 25-hydroxyvitamin D. In contrast, circulating 1,25 dihydroxyvitamin D assay is not considered a good indicator of vitamin D status because of its short half-life and influence by parathyroid hormone, calcium, and phosphate. Circulating 1,25 dihydroxyvitamin D levels do not typically decrease until vitamin D deficiency is severe (National Institutes of Health, 2024).

Findings

Guidelines

The first Endocrine Society guideline recommended 25-hydroxyvitamin D screening for individuals with risk factors and in whom a swift response to optimization of vitamin D status could be expected. The Society recommended using the serum 1,25 dihydroxyvitamin D assay only in monitoring certain conditions, such as acquired and inherited disorders of vitamin D and phosphate metabolism (Holick, 2011).

In 2024, the Endocrine Society Guideline Development Panel established guidance for the use of 25-hydroxyvitamin D testing in generally healthy adults who do not otherwise have established indications for 25-hydroxyvitamin D testing. The Panel issued the following recommendations based on very low- to low- certainty evidence (Demay, 2024):

- Against routine 25-hydroxyvitamin D testing in healthy adults ages 19 and older or during pregnancy.
- Against routine 25-hydroxyvitamin D screening in healthy adults, adults with dark complexion, or adults with obesity.
- Against routine screening for a 25-hydroxyvitamin D level in these populations to guide decision-making (i.e., vitamin D versus no vitamin D).
- Against routine follow-up testing for 25-hydroxyvitamin D level in these populations to guide vitamin D dosing.

In these populations, empiric vitamin D supplementation should generally proceed without testing for baseline 25-hydroxyvitamin D or monitoring subsequent 25-hydroxyvitamin D levels to assess response to supplementation, provided that vitamin D dosages are within established, tolerable upper intake levels. The Panel did not find clinical trial evidence that would support establishing distinct 25-hydroxyvitamin D thresholds tied to outcome-specific benefits in the populations examined. As a result, the Endocrine Society no longer endorses the target 25-hydroxyvitamin D level of 30 ng/ mL (75 nmol/L) suggested in the previous guideline (Holick, 2011), and no longer endorses specific 25-hydroxyvitamin D levels to define vitamin D sufficiency, insufficiency, and deficiency (Demay, 2024).

The Choosing Wisely campaign issued the following testing recommendations for vitamin D deficiency (American Family Physician, 2024a, 2024b):

- Test children linked with low bone mass (e.g., rickets or a history of repeated, low-trauma bone fractures). Avoid ordering vitamin D concentrations routinely in otherwise healthy children, including children who are overweight or obese. Vitamin D supplements are a cost-effective option for children with insufficient dietary intake or for obese children, who often have low vitamin D levels (Source: American Academy of Pediatrics, 2017).
- Test higher risk patients when results will be used to institute more aggressive therapy (e.g., osteoporosis, chronic kidney disease, malabsorption, some infections, obese individuals). While vitamin D deficiency is common in many populations (e.g., patients with limited sun exposure, at higher latitudes, and during winter months), over-the-counter vitamin D supplements and increased summer sun exposure are sufficient for most otherwise healthy patients (Source: Holick, 2011).
- Do not routinely measure 1,25-dihydroxyvitamin D unless the patient has hypercalcemia or decreased kidney function (Source: Holick, 2011).

An updated U.S. Preventive Services Task Force recommendation found insufficient evidence supporting vitamin D screening in community-dwelling, nonpregnant adults who have no signs or symptoms of vitamin D deficiency or conditions for which vitamin D treatment is recommended. This recommendation does not apply to persons who are hospitalized or living in institutions such as nursing homes. The Task Force noted little to no ultraviolet B exposure, older age, obesity, and being non-Hispanic Black as commonly reported risk factors for low vitamin D levels (Krist, 2021).

For treating asymptomatic vitamin D deficiency, there was sufficient evidence that treatment has no benefit on mortality, risk for fractures in persons selected solely on the basis of low vitamin D levels (as opposed to clinical risks such as low bone density), or incidence of type 2 diabetes mellitus. There was insufficient evidence on the benefit of treatment on other outcomes, including falls, cancer, cardiovascular events, depression, infection, or

physical functioning. There was sufficient evidence that the harms of treatment of vitamin D deficiency are small to none (Krist, 2021).

The systematic review on which the Task Force update was based found no studies that directly evaluated the benefits and harms of screening for vitamin D deficiency. Current evidence enrolled participants at risk for deficiency based on low serum vitamin D levels using various assays that may not have been standardized according to current testing standards (Kahwati, 2021).

The American College of Obstetrics and Gynecology stated testing for maternal serum 25-hydroxyvitamin D levels may be considered in pregnant women believed to be at elevated risk of deficiency, and recommended 1,000 to 2,000 international units per day of vitamin D. However, the College did not recommend screening all pregnant women. The recommendation was reaffirmed in 2024 (American College of Obstetrics and Gynecology, 2024).

Evidence review

Recommendations from the first Endocrine Society guideline published in 2011 were based primarily on results from observational studies that consistently reported an association between low vitamin D status (serum 25-hydroxyvitamin D levels) and the risk of many chronic conditions. Since 2011, numerous randomized controlled trials have provided new data on the effects of vitamin D supplementation on skeletal and extra-skeletal outcomes in the general population.

Shah (2024) analyzed the new trial data to support the Endocrine Society's 2024 recommendations. The current evidence suggests potential benefits of empiric vitamin D supplementation in children, individuals 75 years or older, pregnant women, and adults with prediabetes. The investigators also examined whether screening with a serum 25-hydroxyvitamin D test (with vitamin D supplementation/treatment only if below a threshold) versus no screening improves outcomes in the following populations: healthy adults, adults with dark complexion, and adults with obesity. They did not identify evidence from screening trials on the benefits and harms of screening with serum 25-hydroxyvitamin D in the general population or in other selected populations without comorbidities or disorders that affect vitamin D absorption, activation, or metabolism.

In 2022, we updated the U.S. Preventive Services Task Force recommendations (2021) and added recommendations from the Choosing Wisely Campaign. We added chronic use of medications known to lower vitamin D levels as a risk factor for vitamin D deficiency that may warrant periodic screening, and identified acquired and inherited disorders involved in the metabolism of 25-hydroxyvitamin D and phosphate for which monitoring of 1, 25-dihydroxyvitamin D testing may be medically necessary (Holick, 2011).

In 2023, we updated the references and made no changes to the policy.

In 2024, we updated the references and made no changes to the policy.

In 2025, we updated the references and modified policy coverage to align with new recommendations from the Endocrine Society (Demay, 2024).

References

On December 4, 2024, we searched PubMed and the databases of the Cochrane Library, the U.K. National Health Services Centre for Reviews and Dissemination, the Agency for Healthcare Research and Quality, and the Centers for Medicare & Medicaid Services. Search terms were "vitamin d deficiency/diagnosis (MeSH)," "vitamin d deficiency/analysis (MeSH)," and "vitamin D screening." We included the best available evidence according to established evidence hierarchies (typically systematic reviews, meta-analyses, and full economic analyses, where available) and professional guidelines based on such evidence and clinical expertise.

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Policy updates

3/2019: initial review date and clinical policy effective date: 6/2019

5/2020: Policy references updated.

7/2021: Policy references updated.

7/2022: Policy references updated.

2/2023: Policy references updated.

2/2024: Policy references updated.

2/2025: Policy references updated. Coverage modified.