

Editorials: *Controversies in Family Medicine*

Should Family Physicians Screen for Vitamin D Deficiency?

No: Screening Is Unnecessary, and Routine Supplementation Makes More Sense

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There are numerous problems with regularly measuring serum vitamin D levels to assess for deficiency.¹ One issue is the lack of standardization in the screening process. The accepted test is to measure levels of 25-hydroxyvitamin D because of its half-life of three weeks. However, there are six commonly used assay techniques, none of which are standardized. One study that examined the methodology and interpretation of vitamin D measurement set a lenient target requiring that laboratories obtain only 80 percent of their results within 30 percent of the all-laboratory trimmed mean (i.e., an average that removes a small percentage of the largest and smallest values before calculating the mean); only 59 percent of surveyed laboratories could meet this standard.² Measuring vitamin D levels is also expensive, costing between \$50 and \$220 per test in commercial laboratories for patients without insurance.

Another challenge is that the level of 25-hydroxyvitamin D that should be considered normal is unclear. The Institute of Medicine^{3,4} and the Endocrine Society⁵ announced that levels less than 20 ng per mL (50 nmol per L) are considered deficient, which is lower than in previous guidelines. The Endocrine Society also defined insufficiency as less than 30 ng per mL (75 nmol per L), and levels greater than 30 ng per mL are considered sufficient.⁵ In the largest study to date, 1,917 men and women were followed for 6.7 years to determine clinical outcomes (fractures) related to serum 25-hydroxyvitamin D levels. The adjusted relative risk for hip fractures was 0.64 among persons with 25-hydroxyvitamin D levels greater than 25 ng per mL (62.4 nmol per L) compared with those who had lower levels.¹ This is roughly consistent with the Institute of Medicine and Endocrine Society guidelines. A German study found that pathologic demineralization of bone occurred in patients with serum 25-hydroxyvitamin D levels less than 30 ng per mL.⁶ A recent guideline from the European Menopause and Andropause Society defines adequate plasma 25-hydroxyvitamin D levels to be between 30 and 90 ng per mL (75 and 225 nmol per L), because these levels are



This is one in a series of pro/con editorials discussing controversial issues in family medicine.

► See related editorial at <http://www.aafp.org/afp/2013/0415/od1.html>.

associated with stable parathyroid hormone secretion and intestinal calcium absorption.⁷ The association of 25-hydroxyvitamin D levels with other morbid outcomes linked to vitamin D deficiency or insufficiency have not been adequately evaluated.

Another problem with vitamin D screening is that treatment implications are unclear. A physician would, presumably, give supplemental oral vitamin D to patients with low levels of 25-hydroxyvitamin D, but the nonlinear pharmacokinetics of different forms of vitamin D are not well defined, and there are multiple confounding factors. These factors include calcium intake, seasonal variations of 25-hydroxyvitamin D levels, sun exposure, air pollution levels, exercise, obesity (resistance to standard doses of vitamin D), comorbid conditions, and medications. No study has demonstrated that the measurement of serum 25-hydroxyvitamin D levels offers outcome benefits over clinical assessment alone. Although observational studies suggest an association between lower vitamin D levels and systemic non-bone disease, such as cancer and heart disease, there are many other possible explanations. For example, persons with chronic disease may be less active, less likely to get sun exposure, and more likely to smoke and struggle with obesity. To date, randomized controlled trials have not found that vitamin D supplementation improves any of these clinical outcomes.⁸

Finally, there is the issue of cost-effectiveness. The only published cost-analysis of 25-hydroxyvitamin D testing concluded that if 10 percent or more of screening test results showed deficient levels that required intervention, then testing would be more cost-effective than universal supplementation without screening.² The Endocrine Society has issued a formal recommendation against any form of individual vitamin D screening.⁵ British Columbia's Medical Services Commission issued a similar guideline in 2010.⁹ Many experts, despite the lack of clinical trial evidence, have suggested that routine

vitamin D supplementation alone, without routine testing, is the superior clinical strategy because it is cheaper, easier to implement, and more efficient.^{10,11} The recent U.S. Preventive Services Task Force guideline on vitamin D and calcium supplementation calls into question, based on a lack of quality evidence, the value of routine supplementation and casts further doubt on any policy of routine testing of vitamin D levels.¹² Although the evidence remains incomplete, these issues argue strongly against screening for serum 25-hydroxyvitamin D levels as an interim strategy.

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