U.S. Preventive Services Task Force

Vitamin D and Calcium Supplementation to Prevent Fractures in Adults: Recommendation Statement

▶ **See related Putting Prevention into Practice on page 897.**

This summary is one in a series excerpted from the Recommendation Statements released by the U.S. Preventive Services Task Force (USPSTF). These statements address preventive health services for use in primary care clinical settings, including screening tests, counseling, and preventive medications.

The complete version of this statement, including supporting scientific evidence, evidence tables, grading system, members of the USPSTF at the time this recommendation was finalized, and references, is available on the USPSTF website at http://www.uspreventiveservicestaskforce.org/.

A collection of USPSTF recommendation statements reprinted in *AFP* is available at http://www.aafp.org/afp/uspstf.

Summary of Recommendations and Evidence

The U.S. Preventive Services Task Force (USPSTF) concludes that the current evidence is insufficient to assess the balance of the benefits and harms of combined vitamin D and calcium supplementation for the primary prevention of fractures in premenopausal women or in men *(Table 1)*. **I statement.**

The USPSTF concludes that the current evidence is insufficient to assess the balance of the benefits and harms of daily supplementation with greater than 400 IU of vitamin D_3 and greater than 1,000 mg of calcium for the primary prevention

Table 1. Vitamin D and Calcium Supplementation to Prevent Fractures in Adults: Clinical Summary of the USPSTF Recommendation

Population	Men or premenopausal women	Community-dwelling postmenopausal women at doses > 400 IU of vitamin D_3 and > 1,000 mg of calcium	Community-dwelling postmenopausal women at doses ≤ 400 IU of vitamin D_3 and ≤ 1,000 mg of calcium
Recommendation	No recommendation Grade: I statement	No recommendation Grade: I statement	Do not supplement Grade: D recommendation
Behavioral counseling interventions	Appropriate intake of vitamin D and calcium is essential to overall health. However, there is inadequate evidence to determine the effect of combined vitamin D and calcium supplementation on the incidence of fractures in men or premenopausal women. There is adequate evidence that daily supplementation with 400 IU of vitamin D_3 and 1,000 mg of calcium has no effect on the incidence of fractures in postmenopausal women. There is inadequate evidence regarding the effect of higher doses of combined vitamin D and calcium supplementation on fracture incidence in community-dwelling postmenopausal women.		
Balance of benefits and harms	Evidence is lacking regarding the benefit of daily vitamin D and calcium supplementation for the primary prevention of fractures, and the balance of benefits and harms cannot be determined.	Evidence is lacking regarding the benefit of daily supplementation with > 400 IU of vitamin D_3 and > 1,000 mg of calcium for the primary prevention of fractures in postmenopausal women, and the balance of benefits and harms cannot be determined.	Daily supplementation with ≤ 400 IU of vitamin D_3 and ≤ 1,000 mg of calcium has no net benefit for the primary prevention of fractures.
Other relevant USPSTF recommendations	The USPSTF has made recommendations on screening for osteoporosis and vitamin D supplementation to prevent falls in community-dwelling older adults. These recommendations are available at http://www.uspreventiveservicestaskforce.org.		

NOTE: *For a summary of the evidence systematically reviewed in making this recommendation, the full recommendation statement, and supporting documents, go to http://www.uspreventiveservicestaskforce.org.*

USPSTF = U.S. Preventive Services Task Force.

of fractures in noninstitutionalized postmenopausal women. **I statement.**

The USPSTF recommends against daily supplementation with 400 IU or less of vitamin D_3 and 1,000 mg or less of calcium for the primary prevention of fractures in noninstitutionalized postmenopausal women. **D recommendation.**

Go to the Clinical Considerations section for suggestions regarding the I statements.

Rationale

IMPORTANCE

Fractures, particularly hip fractures, are associated with chronic pain and disability, loss of independence, decreased quality of life, and increased mortality.[1] One-half of all postmenopausal women will have an osteoporosis-related fracture during their lifetime.

Appropriate intake of vitamin D and calcium is essential to overall health. The Institute of Medicine has published recommended dietary allowances *(Table 2*[2,3]*)*. However, the benefits and harms of daily supplementation with greater than 400 IU of vitamin D_3 and greater than 1,000 mg of calcium to prevent fractures are not clearly understood.

BENEFITS OF PREVENTIVE MEDICATION

In premenopausal women and in men, there is inadequate evidence to determine the effect of combined vitamin D and calcium supplementation on the incidence of fractures. In postmenopausal women, there is adequate evidence that daily supplementation with 400 IU of vitamin D_3 combined with 1,000 mg of calcium has no effect on the incidence of fractures. However, there is inadequate evidence about the effect of higher doses of combined vitamin D and calcium supplementation on fracture incidence in noninstitutionalized postmenopausal women.

HARMS OF PREVENTIVE MEDICATION

Adequate evidence indicates that supplementation with 400 IU or less of vitamin D_3 and 1,000 mg or less of calcium increases the incidence of renal stones. The USPSTF assessed the magnitude of this harm as small.

USPSTF ASSESSMENT

Noninstitutionalized, Community-Dwelling Postmenopausal Women. The USPSTF concludes that evidence is lacking about the benefit of daily supplementation with greater than 400 IU of vitamin D_3 and greater than 1,000 mg of calcium for the primary prevention of fractures, and the balance of benefits and harms cannot be determined.

The USPSTF concludes with moderate certainty that daily supplementation with 400 IU or less of vitamin D_3 and 1,000 mg or less of calcium has no net benefit for the primary prevention of fractures.

Men and Premenopausal Women. The USPSTF concludes that evidence is lacking about the benefit of vitamin D supplementation with or without calcium for the primary prevention of fractures, and the balance of benefits and harms cannot be determined.

Clinical Considerations

PATIENT POPULATION

This recommendation applies to noninstitutionalized or community-dwelling asymptomatic adults without a history of fractures. Community-dwelling is defined as not residing in an assisted living facility, nursing home, or other institutional care setting. This recommendation does not apply to persons with osteoporosis or vitamin D deficiency.

CONSIDERATIONS FOR PRACTICE REGARDING THE I STATEMENTS

Potential Preventable Burden. The health burden of fractures is substantial in the older adult population.

Potential Harms. In the Women's Health Initiative, a statistically increased incidence of renal stones occurred in women taking supplemental vitamin D and calcium. One woman was diagnosed with a urinary tract stone for every 273 women who received supplementation over a seven-year follow-up period.

Table 2. Institute of Medicine 2011 Recommended Dietary Allowances for Vitamin D and Calcium

	Recommended daily dosage	
Population (age)	*Vitamin D (IU)*	*Calcium (mg)*
Women		
19 to 50 years	600	1,000
51 to 70 years	600	1,200
> 70 years	800	1,200
Pregnant women		
≤ 18 years	600	1,300
> 18 years	600	1,000
Breastfeeding women		
≤ 18 years	600	1,300
> 18 years	600	1,000
Men		
19 to 50 years	600	1,000
51 to 70 years	600	1,000
> 70 years	800	1,200

Information from references 2 and 3.

Costs. Vitamin D and calcium supplements are inexpensive and readily available without a prescription.

Current Practice. Vitamin D and calcium supplementation is often recommended for women, especially postmenopausal women, to prevent fractures. Surveys estimate that 56% of women 60 years and older take supplemental vitamin D, and 60% take a supplement containing calcium. The exact dosage is not known.[4]

OTHER APPROACHES TO PREVENTION

The USPSTF recommends screening for osteoporosis in women 65 years or older and in younger women whose fracture risk is equal to or greater than that of a 65-year-old white woman who has no additional risk factors. This recommendation statement is available on the USPSTF website (http://www.uspreventiveservicestaskforce.org).

The USPSTF recommends vitamin D supplementation (the median dose of vitamin D in available studies was 800 IU) to prevent falls in community-dwelling adults 65 years or older who are at increased risk of falls because of a history of recent falls or vitamin D deficiency (B recommendation). This recommendation statement is available on the USPSTF website (http://www.uspreventiveservicestaskforce.org).

This recommendation statement was first published in *Ann Intern Med.* 2013;158(9):691-696.

The "Other Considerations," "Discussion," and "Recommendations of Others" sections of this recommendation statement are available at http://www.uspreventiveservicestaskforce.org/uspstf/uspsvitd.htm.

REFERENCES

1. Nelson HD, Haney EM, Dana T, Bougatsos C, Chou R. Screening for osteoporosis: an update for the U.S. Preventive Services Task Force. *Ann Intern Med.* 2010;153(2):99-111.
2. Ross CA, Taylor CL, Yaktine AL, Del Valle HB, eds.; Committee to Review Dietary Reference Intakes for Vitamin D and Calcium; Institute of Medicine. *Dietary Reference Intakes for Calcium and Vitamin D.* Washington, DC: National Academy Press; 2011. http://www.nap.edu/catalog.php?record_id=13050. Accessed May 31, 2012.
3. World Health Organization, Food and Agriculture Organization of the United Nations. *Vitamin and Mineral Requirements in Human Nutrition.* 2nd ed. Geneva, Switzerland: World Health Organization; 2004. http://www.who.int/nutrition/publications/micronutrients/9241546123/en/index.html. Accessed May 31, 2012.
4. Gahche J, Bailey R, Burt V, et al. Dietary supplement use among U.S. adults has increased since NHANES III (1988-1994). *NCHS Data Brief.* 2011;(61):1-8. ■