

- Canadian Institute for Health Information. Health care use at the end of life in Western Canada. Ottawa: The Institute; 2007.
 - Workman S, Mann OE. 'No control whatsoever': end-of-life care on a medical teaching unit from the perspective of family members. *QJM* 2007;100:433–40.
 - Lofmark R, Nilstun T. Not if, but how: one way to talk with patients about forgoing life support. *Postgrad Med J* 2000;76(891):26–8.
 - Pierce SF. Improving end-of-life care: gathering suggestions from family members. *Nurs Forum* 1999;34(2):5–14.
 - Johnson DC, Kutner JS, Armstrong JD Jr. Would you be surprised if this patient died? Preliminary exploration of first and second year residents' approach to care decisions in critically ill patients. *BMC Palliat Care* 2003;2(1):1.
 - Christakis NA, Lamont EB. Extent and determinants of error in doctors' prognoses in terminally ill patients: prospective cohort study. *BMJ* 2000;320:469–72.
 - Workman S. A communication model for encouraging optimal care at the end of life for hospitalized patients. *QJM* 2007;100:791–7.
-

Short Snapper

Vitamin D: The New Panacea?

Donald W. Morrish, MD



About the Author

Donald Morrish is with the Department of Medicine, Division of Endocrinology and Metabolism, at the University of Alberta, Edmonton, Alberta.

Vitamin D regulates calcium and phosphate absorption (needed for bone calcification); is antiproliferative on breast, prostate, colon, and skin cells; suppresses immune cells; and enhances muscle strength due to the presence of vitamin D receptors in these tissues. These actions have led to the investigation of vitamin D efficacy in reducing falls, as an immune modulator, and as an anticancer agent.¹

Vitamin D deficiency continues to be prevalent in Western countries, with low vitamin D levels (<50 nmol/L) in 36–57% or more of patients; 27–97% of osteoporosis patients demonstrate levels <30 nmol/L. Above 37° latitude (Atlanta, Georgia), almost no vitamin D is made in the skin between November and March; hence, approximately half the population in these latitudes have vitamin D levels <50 nmol/L. The new recommended intake of at least 800 IU/d is not achievable with current levels of food fortification (e.g., there are 100 IU vitamin D in a glass of milk). Thus, supplementation is necessary. While 800 IU/d generally results in serum levels of >75 nmol/L or more, it may be necessary to measure the 25 OH D₃ level to confirm this.

A goal of therapy is a vitamin D level >80 nmol/L. Inadequate vitamin D levels can be a cause of a poor response to antiresorptive therapy in osteoporosis patients. Doses of 2,000 IU/d, and possibly up to 10,000 IU/d, have not been shown to be harmful.² Interestingly, possible benefits in fracture reduction or cancer prevention only occur with supplements of 800 IU/d or more.

Randomized controlled trials (RCTs) show that taking calcium and 800 IU/d of vitamin D results in a 26% reduction in hip fractures and a 23% reduction in spine fractures, if there is high compliance. An intake

of 800 IU/d vitamin D is associated with a 22% reduction in the incidence of falls. Most epidemiological evidence has suggested an increased incidence of colon, prostate, and breast cancers if vitamin D levels are <50 nmol/L. Few RCTs have been done to corroborate these associations. One small study of 1,179 women using 1,100 IU/d vitamin D showed an all-cancer risk reduction of 60%.³ The Women's Health Initiative did not show any cancer reduction with 400 IU/d vitamin D, but the placebo arm (not receiving estrogen) showed a 29% reduction in colon cancer, indicating an interaction with other hormones. Doses >800–1,000 IU/d are therefore likely needed for its anticancer action. There is also an intriguing reduction in all-cause mortality seen in a meta-analysis of RCTs of vitamin D that needs to be verified.⁴

Currently under development are vitamin D analogues with a high potency for selective noncalcemic actions that may someday succeed in significantly altering disease – compared with the borderline results obtained to date with available vitamin D preparations.

References

- Holick MF. Vitamin D deficiency. *N Engl J Med* 2007;357:266–81.
 - Hathcock JN, Shao A, Vieth R, et al. Risk assessment for vitamin D. *Am J Clin Nutr* 2007;85:6–18.
 - Lappe JM, Travers-Gustafson, Davies KM, et al. Vitamin D and calcium supplementation reduces cancer risk: results of a randomized trial. *Am J Clin Nutr* 2007;85:1586–91.
 - Autier P, Gandini S. Vitamin supplementation and total mortality. *Arch Intern Med* 2007;167:1730–7.
-