

Vitamin D - the known and the unknown

This much researchers know: Vitamin D and calcium play a key role in bone health. Less clear is the quantity of vitamin D needed to achieve certain health outcomes, says Dr. Steven K. Clinton, director of the Prostate and Genitourinary Oncology Clinic at The Ohio State University Comprehensive Cancer Centre - Arthur G. James Cancer Hospital and Richard J. Solove Research Institute (OSUCCC - James).



Clinton was one of 14 academic leaders selected by the Institute of Medicine/National Academy of Sciences to modernise the dietary reference intakes (DRIs) for vitamin D and calcium. It is the first time the guidelines have been updated since they were first proposed in 1997.

Ever since the recommendations came out in December, there have been questions about vitamin D. Dr. Clinton says the reviewers found enough high-quality studies to determine the amount of vitamin D needed to maintain good bone health, but too few solid clinical studies to establish the dietary needs for improving other health outcomes, such as those involving cancer risk, frailty during aging, immune function and neurodegenerative diseases.

DRIs designed to meet the needs of generally healthy Americans

DRIs are public-health guidelines designed to meet the needs of generally healthy Americans - 97.5% of the population - targeting various age groups from birth through the elderly. They help health officials assess the nutritional status of the US population and help physicians to counsel patients. They provide information used for nutrition labels, and ensure that school-lunch, nursing-home and other institutional food programs provide adequate nutrients for good health.

"As expected, when the committee made its recommendations last year, the new DRIs stimulated debate and controversy, leaving many in the public - and even some physicians - unsure of the report's findings," says Clinton, who also leads the OSUCCC - James's Molecular Carcinogenesis and Chemoprevention Program.

A two-year effort

Committee members spent two years examining literature, holding public forums and reviewing intriguing data concerning the influence of vitamin D, in particular, on health outcomes.

"But there were too few high-quality studies, particularly randomised controlled trials over a range of doses, to determine the quantity of vitamin D needed to achieve a certain health outcome - except in one instance, says Clinton. "There is sufficient data from a wealth of studies to show that vitamin D and calcium play key roles in bone health, and to define DRIs, which was the committee's most important finding."

For bone health, the recommended dietary allowances (RDAs) for calcium range between 700 to 1300 milligrams per day for healthy individuals, depending upon age and gender. RDAs for vitamin D are 600 international units (IU) for ages 1 to 70 years, and 800 IU for those age 71 and older.

Since vitamin D can also be synthesised in the skin in response to sunlight, the DRIs were established to provide adequate intake in the absence of sun exposure.

Other findings:

- The majority of Americans and Canadians currently receive adequate amounts of both vitamin D and calcium through their diet and sun exposure. Exceptions include those with poor nutrition, those living at northerly latitudes or in institutions, or those with dark skin pigmentation.
- 4000 IUs was defined as the recommended upper level for dietary intake of vitamin D. This is double the previous amount, yet provides a margin of safety necessary for public health. Intakes beyond this can lead to toxicities such as hypocalcaemia. Recent studies suggest that excessive vitamin D intake may worsen mortality, particularly from certain cancers, or other health issues.
- The report recognises that individuals may need personalised vitamin D and calcium recommendations to prevent or treat certain diseases. For example, physicians treating patients with osteoporosis can provide pharmacologic preparations of vitamin D and monitor the blood levels to insure safety and optimal health outcomes.
- Well-designed human clinical trials over a range of intake levels will be necessary to establish the potential role of

vitamin D in cancer, frailty, immune function and auto-immune diseases, cognition, and cardiovascular disease.

The Ohio State University Comprehensive Cancer Centre - Arthur G. James Cancer Hospital and Richard J. Solove Research Institute (cancer.osu.edu) is one of only 40 Comprehensive Cancer Centres in the United States designated by the National Cancer Institute. Ranked by US News & World Report among the top cancer hospitals in the nation, The James is the 205-bed adult patient-care component of the cancer program at The Ohio State University. The OSUCCC - James is one of only seven centres in the country funded by the NCI to conduct both phase I and phase II clinical trials.

Source: Ohio State University

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