The Importance of Vitamin D in Long-Term Care Residents
By Melvin Hector, MD, FAAFP, CAQ Geriatrics, CMD

Vitamin D, a group of fat-soluble steroidal hormones, is considered an essential vitamin for humans, particularly D3 (cholecalciferol), which is obtained from some animal-based products and ultraviolet light, and D2 (ergocalciferol), which is obtained from certain plants. Having adequate stores of vitamin D is necessary for calcium, magnesium, and phosphate absorption. Vitamin D deficiency can lead to a variety of diseases and impact our overall immune system. Vitamin D deficiency is often related to diet and lack of exposure to sunlight. However, there are other reasons why our absorption of vitamin D may be impaired.

Many of our patients in long-term care have an increased risk for vitamin D deficiency. Aging impacts how our skin absorbs sunlight and produces vitamin D3 (J Clin Invest 1985;76:1536–1538). Aging also affects the ability of the kidneys to process vitamin D’s active form (Endocrinol Metab Clin North Am 2013;42:319–332). Home-bound or institution-bound elderly persons also suffer from vitamin D deficiency due to lack of sun exposure. Medical conditions such as obesity can also affect vitamin D levels. The Centers for Medicare & Medicaid Service’s Local Coverage Determination (LCD) for vitamin D provides a further list of medical conditions that impact vitamin D levels (“Vitamin D: 25 Hydroxy, Includes Fraction(s), If Performed,” LCD ID L33771, rev. Oct. 29, 2020, https://go.cms.gov/3HGDBHl).

Vitamin D deficiency impacts calcium, phosphorous, and bone metabolism (J Clin Endocrinol Metab 2011;96:1911–1930). As noted by Besse Dawson-Hughes, MD, of Tufts University School of Medicine’s Bone Metabolism Laboratory, patients who are deficient face an increased risk of osteomalacia (UpToDate, Sept. 20, 2021; https://bit.ly/3qP9Fy), Vitamin D deficiency can thus impact extraskeletal health, which can cause more frequent falls in the elderly.

Vitamin D supplementation can prevent deficiency. Supplementation may also have a positive impact on cognitive and mental health, immune system function, cardiovascular health, and cancer prevention. But evidence supporting beneficial outcomes has been somewhat inconsistent to date.

Clinical Manifestations of Vitamin D Deficiency

The clinical manifestations of vitamin D deficiency vary. Dr. Dawson-Hughes notes in UpToDate that “the majority of people with mild to mild moderate vitamin D deficiency ... are asymptomatic,” with normal serum calcium, phosphorus, and alkaline phosphatase levels but perhaps with elevated parathyroid hormones — this combination puts them “at increased risk for having accelerated bone loss.” Patients with severe and long-term deficiency, which can lead to osteomalacia, may have more obvious symptoms such as “bone pain and tenderness, muscle weakness, fractures, and difficulty walking.”

Screening for Vitamin D Deficiency

The serum 25(OH)D concentration is generally used to identify vitamin D deficiency. There is some controversy around appropriate concentrations, but the approximate levels include sufficiency as >20 ng/mL; insufficiency as 12 to 20 ng/mL; deficiency as <12 ng/mL; and toxicity as >100 ng/mL (see CMS LCD ID L33771).

The U.S. Preventive Services Task Force does not recommend routine screening for vitamin D deficiency in the general populace (JAMA 2021;325:1436–1442). However, routine screening for vitamin D levels is currently recommended for at least 30 clinical conditions, a list of which can be found in the CMS LCD (ID L33771). The authors state that “patients receiving vitamin D supplementation for prevention of osteoporosis or falls” (BMJ 2014;348:g2035).

The current National Institutes of Health recommended dietary allowance by age includes 800 IU for adults older than 70 (Office of Dietary Supplements, “Vitamin D: Fact Sheet for Consumers,” Aug. 17, 2021; https://bit.ly/3IMq7R). Because some supplements, such as multivitamins, already contain vitamin D, it is important for care staff to ask what residents are already taking. In addition to vitamin D supplementation, calcium supplementation is also necessary.

The CMS LCD also notes that “patients receiving vitamin D supplementation should also be assessed for vitamin D toxicity and disorders of calcium and phosphorus metabolism.” The symptoms of vitamin D toxicity include “nausea, vomiting, poor appetite, constipation, weakness, and weight loss, as well as elevation in the blood level of calcium which in turn can lead to mental status changes, and heart rhythm abnormalities.”

Vitamin D Levels, Mortality, and the Pandemic

In 2012, a prospective cohort study found that vitamin D deficiency was associated with increased mortality among elderly female nursing home residents in Austria (J Clin Endocrinol Metab 2012;97:E653–E657). The authors found that “the majority of elderly institutionalized women were vitamin D deficient in winter,” with a significantly increased mortality risk in those patients with the lowest 25(OH)D levels.

2014 meta-analysis of eight cohort studies from Europe and the United States showed that those persons in the lowest quintile of vitamin
D concentrations were associated with increased all-cause and cardiovascular mortality (BMJ 2014;348:g3656). The authors also noted that two recent systematic reviews of randomized trials confirmed the link between vitamin D and mortality; however, “the effects were weaker than suggested by observational studies, and vitamin D supplementation seemed to be effective only for the administration of vitamin D3 in subjects with low 25(OH)D levels at baseline.”

In 2020, after researchers began to report a link between vitamin D deficiency and a greater risk of COVID-19 infection (JAMA Netw Open 2020;3:e2019722), a quasi-experimental study on vitamin D and survival in COVID-19 patients came to the conclusion that in frail elderly residents “bolus vitamin D3 supplementation taken during or just before COVID-19 was associated with less severe COVID-19 and better survival rate” (J Steroid Biochem Mol Biol 2020;204:105771). The proposed mechanisms included vitamin D3’s modulation of the renin-angiotensin system, thereby reducing pulmonary permeability; the antiviral effects of vitamin D, as documented in many studies; and the stabilizing effect of vitamin D on physical barriers, thereby preventing the virus from reaching tissues as readily. By contrast, corticosteroids, hydroxychloroquine, and dedicated antibiotics showed no predictive difference.

In 2021, a systematic review of eight studies provided “strong evidence that low D3 is a predictor rather than just a side effect of [COVID-19] infection” (Nutrients 2021;13:3596), with the clinical conclusion that “at a threshold level of 30 ng/mL, mortality decreases considerably.” The authors recommended vaccination alongside routine strengthening of the immune system by vitamin D supplementation. Blood levels above 50 ng/mL allow us the best opportunity to get the SARS-CoV2 pandemic under control.

**Recommendations**

1. People living in long-term care and assisted living are at increased risk for hyperovitaminosis D for many different reasons.
2. Recommendations to replete vitamin D to a level above 20 ng/mL may be adequate to prevent osteomalacia.
3. The hormonal and epigenetic effects of vitamin D may make it an important although not yet fully recognized tool in the prevention of viral infections with inflammatory respiratory components, including the SARS-CoV2 virus.
4. The beneficial effects of vitamin D might require a level above 50 ng/mL, which necessitates checking vitamin D levels.

**Aspirin**

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update from their previous stance in 2016, which recommended considering aspirin initiation in adults aged 60-69 for primary prevention when their 10-year CVD risk is >10% and when they have a life expectancy of >10 years and are not at increased risk of bleeding (Ann Intern Med 2016;164:836–845). A 2019 meta-analysis of 15 randomized controlled trials comprising more than 165,000 participants found that aspirin, when used for primary prevention, did reduce the overall occurrence of non-fatal ischemic events (i.e., myocardial infarction, transient ischemic attack, and ischemic stroke), but it was associated with a higher risk of major bleeding, and there was no reduction in the all-cause death rates (J Am Coll Cardiol 2019;73:2915–2929).

The controversy behind the guidelines lies in the question of what one should consider to be a meaningful outcome. Does the potential prevention of non-fatal CVD events (and possible prevention of functional decline, disability, and institutionalization) on a population level outweigh the potential risks of harm to an individual person?

The USPSTF is a panel of experts in primary care who systematically review scientific and medical evidence to develop recommendations for or against medical preventive measures such as screenings, imaging studies, and medications to prevent unwanted diseases and illnesses. They assign letter grades (i.e., A through I) to each recommendation to describe the level of certainty seen in the available evidence that an intervention would be beneficial for a desired health outcome. Grades A and B are assigned when there is thought to be high certainty that the benefit of the intervention is substantial and the intervention is recommended. Grade C is assigned when there is no recommendation for or against the intervention. Grade D is assigned when the evidence points toward recommending against an intervention because the harm likely outweighs the benefits. Grade I denotates insignificant evidence to assess the balance of benefits and harms.

In their most recent recommendation statement regarding aspirin for primary prevention in older adults, the USPSTF assigned the available evidence a grade D, indicating that the increased risk of adverse drug events with aspirin outweighs any potential reduction in non-fatal CVD events. The available evidence does not support the use of aspirin for primary CVD prevention, which means it should be a target for deprescribing in post-acute and long-term care.

These new recommendations do not represent a change for most of our patients and caregivers who have recently heard about these guidelines on TV or through social media.

We have witnessed patients who stop their aspirin because of misunderstandings about what constitutes primary and secondary prevention and a lack of understanding of harms versus benefits. One person with a recent history of ischemic stroke interpreted the updated guidelines to say that aspirin “is not needed for anyone and may cause severe bleeding.” These moments are opportunities to participate in shared decision-making between the clinician and patient, which is really the cornerstone of the practice of preventive medicine in older adults. Our preventive medicine algorithms often do not consider critical pieces of information in the heterogenous population of older adults across the PALTC continuum — such as functional status, cognitive limitations, and life expectancy — so we must rely heavily on discussions with our residents to determine the best next steps.

In summary, the newest recommendations regarding low-dose aspirin initiation in older adults for primary prevention released by the USPSTF in October 2021 are based on a growing body of evidence that demonstrates a lack of benefit and an increased risk of harm with the use of aspirin for primary CVD prevention. Although the evidence has been available for years, many patients still routinely take aspirin for this purpose. Leaders in PALTC must continue to educate providers, patients, residents, and families about evidence-based medicine guidelines for best practice. We also must continue to exercise shared decision-making between the clinician and patient for deprescribing, particularly for those who don’t fit the usual preventive medicine algorithms.

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PARTNER PERSPECTIVE
By Jeanne Manzi, PharmD, BCGP, FASCP, and Robert C. Accetta, RPh, BCGP, FASCP

ASCP, PQA, and AMDA: A Collaboration Using Quality Measures to Advocate for Best Senior Care

The American Society of Consultant Pharmacists (ASCP) is a membership association that was founded in 1969 to represent pharmacists and other health care professionals who work with older adults. ASCP’s mission is “to promote healthy aging by empowering pharmacists with education, resources, and innovative opportunities” (ASCP: Empowering Pharmacists; Transforming Aging, https://www.ascp.com/page/about).


The relationships between PQA and ASCP and between ASCP and AMDA – The Society for Post-Acute and Long-Term Care Medicine highlight the benefits of collaboration to optimize patient care. By aligning the clinical and financial goals among these organizations to improve outcomes, this model of collaboration has demonstrated its value for successful results.

How PQA and ASCP Partner

As a PQA member organization, ASCP works with PQA in multiple ways. ASCP contributes subject matter expertise during measure development and maintenance. ASCP also serves in an advisory role as measures are vetted and finalized for adoption to support measure implementation strategies via its professional relationships. ASCP’s interest in promoting adoption of measures is inclusive of the regulatory level by government agencies and at the grassroots level with allied pharmacy organizations and their membership.

ASCP’s consultant pharmacists partner with other ASCP members and any aligned health care team members, including facility data collection providers (e.g., Minimum Data Set [MDS] coordinators) to ensure education about measures and accuracy in the data coding process. Additionally, they provide traditional medication regimen review services, comprehensive medication reviews for Medicare D beneficiaries in post-acute and long-term care, additional residential care settings, and novel emerging community and telehealth practices.

One example of how ASCP has collaborated with PQA to provide subject matter expertise on a specific PALTc concern is the “Antipsychotic Use in Persons with Dementia (APD)” measure, which “evaluates the percentage of individuals with dementia with a prescription claim for an antipsychotic medication without evidence of a psychotic disorder or related condition.” It was also “adapted for the long-term care setting using MDS data” (“PQA Measures Overview,” Sept. 23, 2021, https://bit.ly/3oUKx6w).

ASCP also collaborated with PQA to understand the intent of the current APD quality measure and identify opportunities for continued quality improvement, which informed ASCP’s policy and position statement on the “Use of Antipsychotic Medications in Nursing Facility Residents” (Apr. 1, 2018, https://bit.ly/3HZLH8u). The position statement aligns the partnership and mission of ASCP with that of AMDA.

How ASCP and AMDA Partner

ASCP members work closely with their facility clients at the corporate ownership, medical leadership, and administrative executive levels to complement the entity’s focus on quality measures. ASCP consultant pharmacists, ASCP member provider pharmacies, and pharmacy managed care organizations ensure alignment with these mutual goals. They work side by side with the Society’s members to ensure that quality measures are shared, strategized, and implemented to ensure individual providers are held accountable for meeting the goals.

Finally, the partnership between ASCP and the Society uses publicly collected data on outcomes statistics related to the measures and compares performance with benchmark state and national averages. Data indicators of poor performance become a focus for attention, including the use of vehicles such as facility Quality Assurance Performance Improvement (QAPI) activities.

“PQA’s mission to optimize health by advancing the quality of medication use is supported by collaboration with ASCP,” said PQA Chief Quality and Innovation Officer Lisa Hines, PharmD, CPHQ. “Our work together and ASCP’s collaboration with AMDA enhances our strategies and ability to promote safe and appropriate medication use for older adults.”

The information presented is a selective summary of publicly available information and is accurate as of the date of writing. Please consult the sources for complete reference information.

Dr. Manzi has been a licensed pharmacist since 1990 and a Board Certified Geriatric Pharmacist since 1998. She is the director of LTC clinical services at Managed Health Care Associates, Inc. The views expressed in this article are those of the author(s) alone and not of Managed Health Care Associates, Inc.

Robert C. Accetta is the president/owner of Rivercare Consulting, LLC. A Board-Certified Geriatric Pharmacist, Rob currently serves on the Board of Directors of the American Society of Consultant Pharmacists (ASCP). He is a graduate of St. John’s University College of Pharmacy and Health Sciences in New York.

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