



Calcium and Vitamin D are Essential for Bone Health

Calcium and vitamin D are essential to building strong, dense bones when you're young and to keeping them strong and healthy as you age. Scientific evidence supports the role of calcium and vitamin D for maintenance of healthy bones at all ages.^{1,2}

Bone is a complex tissue that is composed of a specific type of collagen that is strengthened by the addition of calcium. Ninety-nine percent of the calcium in our bodies is deposited in our bones and teeth. Calcium is also required for a myriad of other functions including muscle contraction, normal functioning of nerves and heart and thousands of biochemical reactions. Each day, we lose calcium through our skin, nails, hair, sweat, urine and feces. Unless we can replace this calcium through dietary supplementation, the body will begin to leach calcium from bone, resulting in a loss of bone structure and strength. It's important to ingest an adequate amount of calcium in our diet to meet these many needs and to prevent the body from "stealing" calcium from bone. As vitamin D is essential for absorption of ingested calcium from the intestine, it is also important to maintain adequate amounts of this important vitamin.

Achieving recommended intakes of nutrients such as calcium, vitamin D and phosphorus, the most critical nutrients for bone, is necessary for optimum bone health.^{1,2} To help guide recommendations, NOF monitors scientific information about dietary patterns and their relationship to bone health and specific bone health outcomes across the lifespan. We are particularly interested in the impact of dietary ingestion of calcium and vitamin D on bone density and fractures. This approach helps NOF to consider the impact of total diet and its component foods and nutrients on bone health outcomes.

Calcium and vitamin D were recently reaffirmed by the 2015 *U.S. Dietary Guidelines Advisory Committee* as nutrients of public health concern because their under-consumption has been linked in the scientific literature to adverse health outcomes.²

NOF and virtually all other organizations in the musculoskeletal field advocate ingestion of recommended dietary calcium and vitamin D from **food sources**. When it is not possible to obtain an adequate amount of calcium from dietary sources (preferably combined with vitamin D), it is important that the shortfall be addressed by taking additional calcium in the form of calcium supplements.^{1,3,4}

¹IOM (Institute of Medicine). 2011. Dietary Reference Intakes for Calcium and Vitamin D. Washington, DC: The National Academies Press.

²Scientific Report of the 2015 Dietary Guidelines Advisory Committee. Available from: <http://www.health.gov/dietaryguidelines/2015-scientific-report/PDFs/Scientific-Report-of-the-2015-Dietary-Guidelines-Advisory-Committee.pdf>.

³National Institutes of Health, Office of Dietary Supplements. Calcium fact sheet for consumers. Viewed 24 July 2015. Available at: <https://ods.od.nih.gov/factsheets/Calcium-Consumer/#h4>.

NOF does not advocate that vitamin D supplements be indiscriminately prescribed for the population at large, but does recognize that extensive scientific evidence has shown a link between supplementation in deficient individuals and fall prevention in community-dwelling adults aged 65 years or older who are at increased risk for falls.⁵

In light of all scientific studies looking at the risks and benefits of vitamin D and calcium, NOF reminds the public of the following three steps for bone health:

1. Aim to get the recommended daily amount of calcium you need from food first and supplement only as needed to make up for any shortfall. There is no benefit to taking more calcium than the recommended daily amount and too much may be harmful. Vitamin D may not be present at adequate levels in food, so you may need to take a supplement to get the recommended amount of vitamin D.
 - NOF recommends⁶ that women age 50 and younger get 1,000 mg of calcium from all sources daily and that women age 51 and older get 1,200 mg.
 - For men, NOF recommends 1,000 mg of calcium daily for those age 70 years and younger and 1,200 mg for men age 71 years and older.
 - Most adults under age 50 years need 400-800 international units (IU) of Vitamin D daily and most adults age 50 years and older need 800-1,000 IU daily.
 - Some individuals need more vitamin D to maintain healthy blood levels of the vitamin, so be sure to talk with your healthcare provider to determine the amount that's right for you.
2. Maintain an overall healthy lifestyle by eating plenty of fruits and vegetables, exercising and not smoking or drinking too much alcohol.
3. If you are diagnosed with osteoporosis, work with your healthcare provider to determine an appropriate treatment plan. This may include medication, as well as counseling on consuming a bone healthy diet rich in both calcium and vitamin D that includes the amounts recommended above, and exercise regimen. Follow your plan and consult with your healthcare provider before making any changes to your treatment.

NOF recognizes that both too little and too much calcium and vitamin D may have deleterious long-term health effects. For this reason our recommendations are conservative and adhere strictly to amounts of these substances that have been proven to be safe and effective.

⁴National Institutes of Health, Office of Dietary Supplements. Vitamin D fact sheet for consumers. Viewed 24 July 2015. Available at: <https://ods.od.nih.gov/factsheets/VitaminD-HealthProfessional/>.

⁵U.S. Preventive Services Task Force. Final Recommendation Statement: Falls Prevention in Older Adults: Counseling and Preventive Medication. Viewed 28 July 2015. Available at: <http://www.uspreventiveservicestaskforce.org/Page/Document/RecommendationStatementFinal/falls-prevention-in-older-adults-counseling-and-preventive-medication>.

⁶How Much Calcium Do You Need? Available at: <http://nof.org/calcium#CALCIUM>