



The NEW ENGLAND JOURNAL of MEDICINE

[FREE NEJM E-TOC](#)
[HOME](#)
[SUBSCRIBE](#)
[CURRENT ISSUE](#)
[PAST ISSUES](#)
[COLLECTIONS](#)

[SEARCH](#)
[Advanced Search](#)
[Sign in](#) | [Get NEJM's E-Mail Table of Contents — Free](#) | [Subscribe](#)

[A correction has been published: N Engl J Med 2006;354\(10\):1102.](#)

[A correction has been published: N Engl J Med 2006;354\(21\):2285.](#)

ORIGINAL ARTICLE

[◀ Previous](#)

Volume 354:669-683

February 16, 2006

Number 7

[Next ▶](#)

Calcium plus Vitamin D Supplementation and the Risk of Fractures

Rebecca D. Jackson, M.D., Andrea Z. LaCroix, Ph.D., Margery Gass, M.D., Robert B. Wallace, M.D., John Robbins, M.D., Cora E. Lewis, M.D., Tamsen Bassford, M.D., Shirley A.A. Beresford, Ph.D., Henry R. Black, M.D., Patricia Blanchette, M.D., Denise E. Bonds, M.D., Robert L. Brunner, Ph.D., Robert G. Brzyski, M.D., Bette Caan, Dr.P.H., Jane A. Cauley, Dr.P.H., Rowan T. Chlebowski, M.D., Steven R. Cummings, M.D., Iris Granek, M.D., Jennifer Hays, Ph.D., Gerardo Heiss, M.D., Susan L. Hendrix, D.O., Barbara V. Howard, Ph.D., Judith Hsia, M.D., F. Allan Hubbell, M.D., Karen C. Johnson, M.D., Howard Judd, M.D., Jane Morley Kotchen, M.D., Lewis H. Kuller, M.D., Robert D. Langer, M.D., Norman L. Lasser, M.D., Marian C. Limacher, M.D., Shari Ludlam, M.P.H., JoAnn E. Manson, M.D., Karen L. Margolis, M.D., Joan McGowan, Ph.D., Judith K. Ockene, Ph.D., Mary Jo O'Sullivan, M.D., Lawrence Phillips, M.D., Ross L. Prentice, Ph.D., Gloria E. Sarto, M.D., Marcia L. Stefanick, Ph.D., Linda Van Horn, Ph.D., Jean Wactawski-Wende, Ph.D., Evelyn Whitlock, M.D., Garnet L. Anderson, Ph.D., Annlouise R. Assaf, Ph.D., David Barad, M.D., for the Women's Health Initiative Investigators

ABSTRACT

Background The efficacy of calcium with vitamin D supplementation for preventing hip and other fractures in healthy postmenopausal women remains equivocal.

Methods We recruited 36,282 postmenopausal women, 50 to 79 years of age, who were already enrolled in a Women's Health Initiative (WHI) clinical trial. We randomly assigned participants to receive 1000 mg of elemental calcium as calcium carbonate with 400 IU of vitamin D₃ daily or placebo. Fractures were ascertained for an average follow-up period of 7.0 years. Bone density was measured at three WHI centers.

Results Hip bone density was 1.06 percent higher in the calcium plus vitamin D group than in the placebo group (P<0.01). Intention-to-treat analysis indicated that participants receiving calcium plus vitamin D supplementation had a hazard ratio of 0.88 for hip fracture (95 percent confidence interval, 0.72 to 1.08), 0.90 for clinical spine fracture (0.74 to 1.10), and 0.96 for total fractures (0.91 to 1.02). The risk of renal calculi increased with calcium plus vitamin D (hazard ratio, 1.17; 95 percent confidence interval, 1.02 to 1.34). Censoring data from women when they ceased to adhere to the study medication reduced the hazard ratio for hip fracture to 0.71 (95 percent confidence interval, 0.52 to 0.97). Effects did not vary significantly according to prerandomization serum vitamin D levels.

Conclusions Among healthy postmenopausal women, calcium with vitamin D supplementation resulted in a small but significant improvement in hip bone density, did not significantly reduce hip fracture, and increased the risk of kidney stones.

(ClinicalTrials.gov number, NCT00000611 [[ClinicalTrials.gov](#)].)

Source Information

Address reprint requests to Dr. Jackson at the Division of Endocrinology, Ohio State University, 485 McCampbell, 1581 Dodd Dr., Columbus, OH 43210, or at jackson.20@osu.edu.

Full Text of this Article

This article has been cited by other articles:

- Crew, K. D., Shane, E., Cremers, S., McMahon, D. J., Irani, D., Hershman, D. L. (2009). High Prevalence of Vitamin D Deficiency Despite Supplementation in Premenopausal Women With Breast Cancer Undergoing Adjuvant Chemotherapy. *JCO* 27: 2151-2156 [[Abstract](#)] [[Full Text](#)]
- LaCroix, A. Z., Kotchen, J., Anderson, G., Brzyski, R., Cauley, J. A., Cummings, S. R., Gass, M., Johnson, K. C., Ko, M., Larson, J. E., Stefanick, M. L., Wactawski-Wende, J. (2009). Calcium Plus Vitamin D Supplementation and Mortality in Postmenopausal Women: The Women's Health Initiative Calcium-Vitamin D Randomized Controlled Trial. *J Gerontol A Biol Sci Med Sci* 64A: 559-567 [[Abstract](#)] [[Full Text](#)]
- Bischoff-Ferrari, H. A., Willett, W. C., Wong, J. B., Stuck, A. E., Staehelin, H. B., Orav, E. J., Thoma, A., Kiel, D. P., Henschkowski, J. (2009). Prevention of Nonvertebral Fractures With Oral Vitamin D and Dose Dependency: A Meta-analysis of Randomized Controlled Trials. *Arch Intern Med* 169: 551-561 [[Abstract](#)] [[Full Text](#)]
- Colt, E., Gorich, G., Quinlan, S., Raj, R., Thornton, J., Matti, B., Pierson, R. Jr, Quinlan, E. (2009). Quantitative Heel Ultrasonography, 25-Hydroxyvitamin D, and Urine Amino-terminal Cross-linking Telopeptide of Type I Collagen in Patients With a Recent Hip Fracture. *J Ultrasound Med* 28: 337-343 [[Abstract](#)] [[Full Text](#)]
- Hegge, K. A., Fornoff, A. S., Gutierrez, S. L., Haack, S. L. (2009). New Therapies for Osteoporosis. *Journal of Pharmacy Practice* 22: 53-64 [[Abstract](#)]
- Chlebowski, R. T., Johnson, K. C., Kooperberg, C., Pettinger, M., Wactawski-Wende, J., Rohan, T., Rossouw, J., Lane, D., O'Sullivan, M. J., Yasmeen, S., Hiatt, R. A., Shikany, J. M., Vitolins, M., Khandekar, J., Hubbell, F. A., for the Women's Health Initiative Investigators, (2008). Calcium Plus Vitamin D Supplementation and the Risk of Breast Cancer. *JNCI J Natl Cancer Inst* 100: 1581-1591 [[Abstract](#)] [[Full Text](#)]
- Speers, C., Brown, P. (2008). Breast Cancer Prevention Using Calcium and Vitamin D: A Bright Future?. *JNCI J Natl Cancer Inst* 100: 1562-1564 [[Full Text](#)]

NEJM's E-Mail
Table of Contents
[SIGN UP NOW FREE](#)

THIS ARTICLE

- ▶ Full Text
- ▶ PDF
- ▶ PDA Full Text
- ▶ PowerPoint Slide Set

COMMENTARY

- ▶ Editorial
by Finkelstein, J. S.

TOOLS & SERVICES

- ▶ Add to Personal Archive
- ▶ Add to Citation Manager
- ▶ Notify a Friend
- ▶ E-mail When Cited
- ▶ E-mail When Letters Appear

MORE INFORMATION

- ▶ Related Article
- ▶ Related Article
by Terris, S.
- ▶ PubMed Citation

- Reid, I. R., Ames, R., Mason, B., Reid, H. E., Bacon, C. J., Bolland, M. J., Gamble, G. D., Grey, A., Horne, A. (2008). Randomized Controlled Trial of Calcium Supplementation in Healthy, Nonosteoporotic, Older Men. *Arch Intern Med* 168: 2276-2282 [[Abstract](#)] [[Full Text](#)]
- Kearns, A.E., Kallmes, D.F. (2008). Osteoporosis Primer for the Vertebroplasty Practitioner: Expanding the Focus Beyond Needles and Cement. *Am. J. Neuroradiol.* 29: 1816-1822 [[Abstract](#)] [[Full Text](#)]
- Margolis, K. L., Ray, R. M., Van Horn, L., Manson, J. E., Allison, M. A., Black, H. R., Beresford, S. A.A., Connelly, S. A., Curb, J. D., Grimm, R. H. Jr, Kotchen, T. A., Kuller, L. H., Wassertheil-Smolter, S., Thomson, C. A., Torner, J. C., for the Women's Health Initiative Investigators, (2008). Effect of Calcium and Vitamin D Supplementation on Blood Pressure: The Women's Health Initiative Randomized Trial. *Hypertension* 52: 847-855 [[Abstract](#)] [[Full Text](#)]
- Lonning, P. E. (2008). Endocrine Therapy and Bone Loss in Breast Cancer: Time to Close in the RANK(L)? *JCO* 26: 4859-4861 [[Full Text](#)]
- Heaney, R. P. (2008). Calcium Supplementation and Incident Kidney Stone Risk: A Systematic Review. *J. Am. Coll. Nutr.* 27: 519-527 [[Abstract](#)] [[Full Text](#)]
- Qaseem, A., Snow, V., Shekelle, P., Hopkins, R. Jr., Forciea, M. A., Owens, D. K., for the Clinical Efficacy Assessment Subcommittee, (2008). Pharmacologic Treatment of Low Bone Density or Osteoporosis to Prevent Fractures: A Clinical Practice Guideline from the American College of Physicians. *ANN INTERN MED* 149: 404-415 [[Abstract](#)] [[Full Text](#)]
- Heaney, R. P. (2008). Nutrients, Endpoints, and the Problem of Proof. *J. Nutr.* 138: 1591-1595 [[Full Text](#)]
- Cauley, J. A., LaCroix, A. Z., Wu, L., Horwitz, M., Danielson, M. E., Bauer, D. C., Lee, J. S., Jackson, R. D., Robbins, J. A., Wu, C., Stanczyk, F. Z., LeBoff, M. S., Wactawski-Wende, J., Sarto, G., Ockene, J., Cummings, S. R. (2008). Serum 25-Hydroxyvitamin D Concentrations and Risk for Hip Fractures. *ANN INTERN MED* 149: 242-250 [[Abstract](#)] [[Full Text](#)]
- Brannon, P. M., Yetley, E. A., Bailey, R. L., Picciano, M. F. (2008). Overview of the conference "Vitamin D and Health in the 21st Century: an Update". *Am. J. Clin. Nutr.* 88: 483S-490S [[Abstract](#)] [[Full Text](#)]
- Cranney, A., Weiler, H. A., O'Donnell, S., Pui, L. (2008). Summary of evidence-based review on vitamin D efficacy and safety in relation to bone health. *Am. J. Clin. Nutr.* 88: 513S-519S [[Abstract](#)] [[Full Text](#)]
- Dawson-Hughes, B. (2008). Serum 25-hydroxyvitamin D and functional outcomes in the elderly. *Am. J. Clin. Nutr.* 88: 537S-540S [[Abstract](#)] [[Full Text](#)]
- Aloia, J. F. (2008). African Americans, 25-hydroxyvitamin D, and osteoporosis: a paradox. *Am. J. Clin. Nutr.* 88: 545S-550S [[Abstract](#)] [[Full Text](#)]
- Brannon, P. M., Yetley, E. A., Bailey, R. L., Picciano, M. F. (2008). Summary of roundtable discussion on vitamin D research needs. *Am. J. Clin. Nutr.* 88: 587S-592S [[Abstract](#)] [[Full Text](#)]
- Hadji, P., Body, J. -J., Aapro, M. S., Brufsky, A., Coleman, R. E., Guise, T., Lipton, A., Tubiana-Hulin, M. (2008). Practical guidance for the management of aromatase inhibitor-associated bone loss. *Ann Oncol* 19: 1407-1416 [[Abstract](#)] [[Full Text](#)]
- Hunt, J. R., Hunt, C. D., Zito, C. A., Idso, J. P., Johnson, L. K. (2008). Calcium Requirements of Growing Rats Based on Bone Mass, Structure, or Biomechanical Strength Are Similar. *J. Nutr.* 138: 1462-1468 [[Abstract](#)] [[Full Text](#)]
- Tyler, C. V., Werner, J. J., Panaite, V., Snyder, S. M., Ford, D. B., Conway, J. L., Young, C. W., Powell, B. L., Smolak, M. J., Zyzanski, S. J. (2008). Barriers to Supplemental Calcium Use Among Women in Suburban Family Practice: A Report from the Cleveland Clinic Ambulatory Research Network (CleAR-eN). *J Am Board Fam Med* 21: 293-299 [[Abstract](#)] [[Full Text](#)]
- Cole, Z., Dennison, E., Cooper, C. (2008). Update on the treatment of post-menopausal osteoporosis. *Br Med Bull* 86: 129-143 [[Abstract](#)] [[Full Text](#)]
- Walker, M. D., Novotny, R., Bilezikian, J. P., Weaver, C. M. (2008). Race and Diet Interactions in the Acquisition, Maintenance, and Loss of Bone. *J. Nutr.* 138: 1256S-1260S [[Abstract](#)] [[Full Text](#)]
- Hoogendijk, W. J. G., Lips, P., Dik, M. G., Deeg, D. J. H., Beekman, A. T. F., Penninx, B. W. J. H. (2008). Depression Is Associated With Decreased 25-Hydroxyvitamin D and Increased Parathyroid Hormone Levels in Older Adults. *Arch Gen Psychiatry* 65: 508-512 [[Abstract](#)] [[Full Text](#)]
- Jamal, S. A., Emanoilidis, H. (2008). Review: calcium supplementation, with or without vitamin D, prevents osteoporotic fractures in older people. *Evid. Based Med.* 13: 53-53 [[Full Text](#)]
- Forbes, D. A. (2008). Review: calcium supplementation, with or without vitamin D, prevents osteoporotic fractures in people >=50 years of age. *Evid. Based Nurs.* 11: 59-59 [[Full Text](#)]
- Daly, R. M., Petrass, N., Bass, S., Nowson, C. A. (2008). The skeletal benefits of calcium- and vitamin D3-fortified milk are sustained in older men after withdrawal of supplementation: an 18-mo follow-up study. *Am. J. Clin. Nutr.* 87: 771-777 [[Abstract](#)] [[Full Text](#)]
- Lappe, J. M., Heaney, R. P. (2008). Results may not be generalisable. *BMJ* 336: 403-403 [[Full Text](#)]
- MacLaughlin, E. J., Raehl, C. L. (2008). ASHP Therapeutic Position Statement on the Prevention and Treatment of Osteoporosis in Adults. *Am J Health Syst Pharm* 65: 343-357 [[Full Text](#)]
- MacLean, C., Newberry, S., Maglione, M., McMahon, M., Ranganath, V., Suttorp, M., Mojica, W., Timmer, M., Alexander, A., McNamara, M., Desai, S. B., Zhou, A., Chen, S., Carter, J., Tringale, C., Valentine, D., Johnson, B., Grossman, J. (2008). Systematic Review: Comparative Effectiveness of Treatments to Prevent Fractures in Men and Women with Low Bone Density or Osteoporosis. *ANN INTERN MED* 148: 197-213 [[Abstract](#)] [[Full Text](#)]
- Jones, G., Winzenberg, T. (2008). Cardiovascular risks of calcium supplements in women. *BMJ* 336: 226-227 [[Full Text](#)]
- Winzenberg, T., Jones, G. (2008). Recommended Calcium Intakes in Children: Have We Set the Bar Too High?. *IBMS BoneKEy* 5: 59-68 [[Abstract](#)] [[Full Text](#)]
- Wang, T. J., Pencina, M. J., Booth, S. L., Jacques, P. F., Ingelsson, E., Lanier, K., Benjamin, E. J., D'Agostino, R. B., Wolf, M., Vasan, R. S. (2008). Vitamin D Deficiency and Risk of Cardiovascular Disease. *Circulation* 117: 503-511 [[Abstract](#)] [[Full Text](#)]
- Aspray, T. J., Francis, R. M. (2008). Vitamin D deficiency can old age learn from childhood?. *Age Ageing* 37: 6-7 [[Full Text](#)]
- Nieves, J. W., Lindsay, R. (2007). Calcium and fracture risk. *Am. J. Clin. Nutr.* 86: 1579-1580 [[Full Text](#)]
- Roddam, A. W., Neale, R., Appleby, P., Allen, N. E., Tipper, S., Key, T. J. (2007). Association between Plasma 25-Hydroxyvitamin D Levels and Fracture Risk: The EPIC-Oxford Study. *Am J Epidemiol* 166: 1327-1336 [[Abstract](#)] [[Full Text](#)]
- Francis, R. M. (2007). The Vitamin D Paradox. *Rheumatology (Oxford)* 46: 1749-1750 [[Full Text](#)]
- Robbins, J., Aragaki, A. K., Kooperberg, C., Watts, N., Wactawski-Wende, J., Jackson, R. D., LeBoff, M. S., Lewis, C. E., Chen, Z., Stefanick, M. L., Cauley, J. (2007). Factors Associated With 5-Year Risk of Hip Fracture in Postmenopausal Women. *JAMA* 298: 2389-2398 [[Abstract](#)] [[Full Text](#)]
- Wang, R., Lagakos, S. W., Ware, J. H., Hunter, D. J., Drazen, J. M. (2007). Statistics in Medicine -- Reporting of Subgroup Analyses in Clinical Trials. *NEJM* 357: 2189-2194 [[Full Text](#)]
- Bouillon, R., Norman, A. W., Lips, P., Cava, R. C., Javier, A. N. D., Howe, W. R., Dellavalle, R., Baroncelli, G. I., Holick, M. F. (2007). Vitamin D Deficiency. *NEJM* 357: 1980-1982 [[Full Text](#)]
- Schlechte, J. A. (2007). Update in Endocrinology. *ANN INTERN MED* 147: 563-572 [[Full Text](#)]
- Autier, P., Gandini, S. (2007). Vitamin D Supplementation and Total Mortality: A Meta-analysis of Randomized Controlled Trials. *Arch Intern Med* 167: 1730-1737 [[Abstract](#)] [[Full Text](#)]
- Cook, N. R., Albert, C. M., Gaziano, J. M., Zaharris, E., MacFadyen, J., Danielson, E., Buring, J. E., Manson, J. E. (2007). A Randomized Factorial Trial of Vitamins C and E and Beta Carotene in the Secondary Prevention of Cardiovascular Events in Women: Results From the Women's Antioxidant Cardiovascular Study. *Arch Intern Med* 167: 1610-1618 [[Abstract](#)] [[Full Text](#)]
- Gralow, J. R. (2007). Bone Density in Breast Cancer: When to Intervene?. *JCO* 25: 3194-3197 [[Full Text](#)]
- McLeod, K. M., McCann, S. E., Horvath, P. J., Wactawski-Wende, J. (2007). Predictors of Change in Calcium Intake in Postmenopausal Women after Osteoporosis Screening. *J. Nutr.* 137: 1968-1973 [[Abstract](#)] [[Full Text](#)]
- Huang, H.-Y., Teutsch, S., Bass, E. (2007). Antioxidant Supplements and Mortality. *JAMA* 298: 400-401 [[Full Text](#)]
- Holick, M. F. (2007). Vitamin D Deficiency. *NEJM* 357: 266-281 [[Full Text](#)]
- Harrington, D. W., Munekata, M. T. (2007). Update in General Internal Medicine. *ANN INTERN MED* 147: 104-116 [[Full Text](#)]
- Hsia, J., Heiss, G., Ren, H., Allison, M., Dolan, N. C., Greenland, P., Heckbert, S. R., Johnson, K. C., Manson, J. E., Sidney, S., Trevisan, M. (2007). Response to Letters Regarding Article, "Calcium/Vitamin D Supplementation and Cardiovascular Events". *Circulation* 116: e87-e87 [[Full Text](#)]
- Wittes, J., Barrett-Connor, E., Braunwald, E., Chesney, M., Cohen, H. J., DeMets, D., Dunn, L., Dwyer, J., Heaney, R. P., Vogel, V., Walters, L., Yusuf, S. (2007). Monitoring the randomized trials of the Women's Health Initiative: the experience of the Data and Safety Monitoring Board. *Clin Trials* 4: 218-234 [[Abstract](#)]
- Straub, D. A. (2007). Calcium Supplementation in Clinical Practice: A Review of Forms, Doses, and Indications. *Nutr Clin Pract* 22: 286-296 [[Abstract](#)] [[Full Text](#)]
- Shinchuk, L., Holick, M. F. (2007). Vitamin D and Rehabilitation: Improving Functional Outcomes. *Nutr Clin Pract* 22: 297-304 [[Abstract](#)] [[Full Text](#)]
- Khosla, S., Melton, L. J. III (2007). Osteopenia. *NEJM* 356: 2293-2300 [[Full Text](#)]
- Caan, B., Neuhouser, M., Aragaki, A., Lewis, C. B., Jackson, R., LeBoff, M. S., Margolis, K. L., Powell, L., Uwaifo, G., Whitlock, E., Wylie-Rosett, J., LaCroix, A. (2007). Calcium Plus Vitamin D Supplementation and the Risk of Postmenopausal Weight Gain. *Arch Intern Med* 167: 893-902 [[Abstract](#)] [[Full Text](#)]
- Ma, J., Johns, R. A., Stafford, R. S. (2007). Americans are not meeting current calcium recommendations. *Am. J. Clin. Nutr.* 85: 1361-1366 [[Abstract](#)] [[Full Text](#)]
- Riddell, L. (2007). Calcium reduced loss of bone mineral density but did not prevent fractures in healthy postmenopausal women. *Evid. Based Nurs.* 10: 53-53 [[Full Text](#)]
- Duque, G. (2007). As a Matter of Fat: New Perspectives on the Understanding of Age-Related Bone Loss. *IBMS BoneKEy* 4: 129-140 [[Abstract](#)] [[Full Text](#)]
- Pressley, J. C., Barlow, B., Quitel, L., Jafri, A. (2007). Improving Access to Comprehensive Injury Risk Assessment and Risk Factor Reduction in Older Adult

- Populations. *Am. J. Public Health* 97: 676-678 [\[Abstract\]](#) [\[Full Text\]](#)
- Boonen, S., Lips, P., Bouillon, R., Bischoff-Ferrari, H. A., Vanderschueren, D., Haentjens, P. (2007). Need for Additional Calcium to Reduce the Risk of Hip Fracture with Vitamin D Supplementation: Evidence from a Comparative Metaanalysis of Randomized Controlled Trials. *J. Clin. Endocrinol. Metab.* 92: 1415-1423 [\[Abstract\]](#) [\[Full Text\]](#)
 - Curtis, J. R., Westfall, A. O., Allison, J., Becker, A., Melton, M. E., Freeman, A., Kiefe, C. I., MacArthur, M., Ockershausen, T., Stewart, E., Weissman, N., Saag, K. G. (2007). Challenges in Improving the Quality of Osteoporosis Care for Long-term Glucocorticoid Users: A Prospective Randomized Trial. *Arch Intern Med* 167: 591-596 [\[Abstract\]](#) [\[Full Text\]](#)
 - Shoback, D. (2007). Update in Osteoporosis and Metabolic Bone Disorders. *J. Clin. Endocrinol. Metab.* 92: 747-753 [\[Abstract\]](#) [\[Full Text\]](#)
 - Hsia, J., Heiss, G., Ren, H., Allison, M., Dolan, N. C., Greenland, P., Heckbert, S. R., Johnson, K. C., Manson, J. E., Sidney, S., Trevisan, M., for the Women's Health Initiative Investigators. (2007). Calcium/Vitamin D Supplementation and Cardiovascular Events. *Circulation* 115: 846-854 [\[Abstract\]](#) [\[Full Text\]](#)
 - Walters, J R F, West, J (2007). Analysis of the absolute risks in coeliac disease indicates the importance of the prevention of osteoporosis * Author's reply. *Gut* 56: 310-311 [\[Full Text\]](#)
 - Schulman, J. E., Williams, S., Khera, O., Sahba, T., Michelson, J., Fine, K. (2007). Effective Osteoporosis Education in the Outpatient Orthopaedic Setting. *JBJS* 89: 301-306 [\[Abstract\]](#) [\[Full Text\]](#)
 - Hathcock, J. N., Shao, A., Vieth, R., Heaney, R. (2007). Risk assessment for vitamin D. *Am. J. Clin. Nutr.* 85: 6-18 [\[Abstract\]](#) [\[Full Text\]](#)
 - Heaney, R. P. (2007). Bone health. *Am. J. Clin. Nutr.* 85: 300S-303S [\[Abstract\]](#) [\[Full Text\]](#)
 - Prentice, R. L. (2007). Clinical trials and observational studies to assess the chronic disease benefits and risks of multivitamin-multimineral supplements. *Am. J. Clin. Nutr.* 85: 308S-313S [\[Abstract\]](#) [\[Full Text\]](#)
 - Gillies, P. J., Krul, E. S. (2007). Using Genetic Variation to Optimize Nutritional Preemption. *J. Nutr.* 137: 270S-274S [\[Abstract\]](#) [\[Full Text\]](#)
 - Cunningham, J. (2007). Pathogenesis and Prevention of Bone Loss in Patients Who Have Kidney Disease and Receive Long-Term Immunosuppression. *J. Am. Soc. Nephrol.* 18: 223-234 [\[Abstract\]](#) [\[Full Text\]](#)
 - Cummings, S. R. (2006). A 55-Year-Old Woman With Osteopenia. *JAMA* 296: 2601-2610 [\[Abstract\]](#) [\[Full Text\]](#)
 - Cole, P. A., Bhandari, M. (2006). What's New in Orthopaedic Trauma. *JBJS* 88: 2545-2561 [\[Full Text\]](#)
 - Winzenberg, T., Shaw, K., Fryer, J., Jones, G. (2006). Effects of calcium supplementation on bone density in healthy children: meta-analysis of randomised controlled trials. *BMJ* 333: 775- [\[Abstract\]](#) [\[Full Text\]](#)
 - Riddell, L. (2006). Calcium plus vitamin D did not prevent fractures or colorectal cancer in postmenopausal women. *Evid. Based Nurs.* 9: 114-114 [\[Full Text\]](#)
 - Heaney, R. P. (2006). Nutrition, chronic disease, and the problem of proof. *Am. J. Clin. Nutr.* 84: 471-472 [\[Full Text\]](#)
 - Visser, M., Deeg, D. J., Puts, M. T., Seidell, J. C., Lips, P. (2006). Low serum concentrations of 25-hydroxyvitamin D in older persons and the risk of nursing home admission. *Am. J. Clin. Nutr.* 84: 616-622 [\[Abstract\]](#) [\[Full Text\]](#)
 - Diaz-Lopez, B., Cannata-Andia, J. B. (2006). Supplementation of vitamin D and calcium: advantages and risks. *Nephrol Dial Transplant* 21: 2375-2377 [\[Full Text\]](#)
 - Aspray, T. J., Francis, R. M. (2006). Fracture prevention in care home residents: is vitamin D supplementation enough?. *Age Ageing* 35: 455-456 [\[Full Text\]](#)
 - Wildschut, H. I.J., Peters, T.J., Weiner, C. P. (2006). Screening in women's health, with emphasis on fetal Down's syndrome, breast cancer and osteoporosis. *Hum Reprod Update* 12: 499-512 [\[Abstract\]](#) [\[Full Text\]](#)
 - (2006). Additional articles abstracted in ACP Journal Club. *Evid. Based Med.* 11: 126-126 [\[Full Text\]](#)
 - Granger, C. B., McMurray, J. J.V. (2006). Using Measures of Disease Progression to Determine Therapeutic Effect: A Sirens' Song. *J Am Coll Cardiol* 48: 434-437 [\[Abstract\]](#) [\[Full Text\]](#)
 - Michels, K. B. (2006). The women's health initiative--curse or blessing?. *Int J Epidemiol* 35: 814-816 [\[Full Text\]](#)
 - Aberegg, S. K., Majure, D. T. (2006). Low-fat diet and cardiovascular disease. *JAMA* 296: 280-280 [\[Full Text\]](#)
 - Howard, B. V., Anderson, G. L., Caan, B., Hsia, J., Johnson, K., Limacher, M., Manson, J. E., Prentice, R. L., Stefanick, M. L., Wassertheil-Smoller, S., Van Horn, L., for the Writing Groups for the WHI Investigators. (2006). Low-Fat Diet and Cardiovascular Disease--Reply. *JAMA* 296: 280-281 [\[Full Text\]](#)
 - Bischoff-Ferrari, H. A., Giovannucci, E., Willett, W. C., Dietrich, T., Dawson-Hughes, B. (2006). Estimation of optimal serum concentrations of 25-hydroxyvitamin D for multiple health outcomes. *Am. J. Clin. Nutr.* 84: 18-28 [\[Abstract\]](#) [\[Full Text\]](#)

HOME | SUBSCRIBE | SEARCH | CURRENT ISSUE | PAST ISSUES | COLLECTIONS | PRIVACY | TERMS OF USE | HELP | beta.nejm.org

Comments and questions? Please [contact us](#).

The New England Journal of Medicine is owned, published, and [copyrighted](#) © 2009 [Massachusetts Medical Society](#). All rights reserved.