

Heaney finds the least fault with the tracer method. When the test nutrient is properly tagged, he has found tracer methods to be "highly sensitive and reproducible, and depending upon the tracer used, [they] can be very quick and inexpensive." It is important to recognize that bioavailability of pure salts is not the same as bioavailability of the pharmaceutical formulations. In Dr. Heaney's experience "the pure salt is often somewhat better absorbed than the pharmaceutical mixture."

In evaluating human studies of a preparation's bioavailability, Dr. Heaney says that subject factors (i.e., age, mucosal mass, intestinal transit time, and nutritional status) can affect outcome. People with calcium deficiencies are more likely to absorb supplemental calcium than those with diets high in calcium. He also notes that absorption increases when taking calcium supplements in divided doses throughout the day "by as much as 80% relative to the same intake ingested as a single bolus." Other factors that may increase calcium absorption, according to the National Nutrition Foods Association, include exercise, increase in vitamin D levels, intestinal acid, ingestion with a meal, acidic amino acids, and increased metabolic needs caused by growth, pregnancy, and lactation.

Although literature about calcium supplements is primarily aimed at supporting bone health, calcium and the salts have other positive effects. Unabsorbed calcium reduces the risk of kidney stones and colon cancer by combining with oxalic acid, bile acids, and other harmful substances left over from digestion. Carbonate, lactate and citrate salts may help neutralize a diet that is high in acid-forming foods. Dr. Heaney says that phosphate salts of calcium may be especially helpful for the elderly. Phosphorus is the second most abundant mineral, after calcium, in bone. Given the widespread distribution of the mineral in animal proteins, nuts, legumes, grains, and soda drinks, few realize that the elderly, particularly those receiving bone-strengthening drugs and supplemental calcium, may not be getting enough phosphorus. "Without adequate attention to meeting the phosphate requirements for bone building," Dr. Heaney warns, "therapeutic success in these patients may be limited."

Dr. Heaney questions manufacturers' pursuit of enhanced bioavailability for poorly absorbed nutrients like calcium. Focusing on bioavailability, according to Dr. Heaney, "seems inappropriate and misdirected from both cost benefit and nutritional considerations." He sees little point in buying a supplement that is absorbed at 40% efficiency that costs twice as much as one absorbed at 30% efficiency. Dr. Heaney, who is considered an expert on calcium, has not found a calcium supplement that meets manufacturer's claims of superiority that justify significantly higher prices.

While no calcium supplement is notably superior to any other, some supplements contain harmful metals. A study by E. A. Ross, N. J. Szabo, and I. R. Tabbett (*JAMA*, September 20, 2000) reports that some over-the-counter natural and refined calcium carbonate products, as well as bone-meal and dolomite, contain high amounts of lead. The authors recommend using supplements from reputable manufacturers that test for lead content.

Heaney, Robert P. Factors Influencing the Measurement of Bioavailability, taking Calcium as a Model. *Journal of Nutrition*. 2001;131:1344S-1348S. [www.nutrition.org](http://www.nutrition.org)  
 Mas, Charles H.V. MD. Microcrystalline Hydroxyapatite. 1996. [www.healthierwhey.com](http://www.healthierwhey.com)  
 McCormick, Charles C., PhD. Calcium & Osteoporosis - A Weak Link. Cornell Cooperative Extension. [www.cce.cornell.edu/food/](http://www.cce.cornell.edu/food/)  
 NNFA. Calcium. No date. [www.nffa.org/services/science/bg\\_calcium.htm](http://www.nffa.org/services/science/bg_calcium.htm)  
 Ross EA, Szabo NJ, Tabbett IR. Lead content of calcium supplements. *JAMA* 2000 Sept 20

## Drug-Induced Osteoporosis

Some pharmaceutical drugs are known to cause bone loss. In November 2004, Depo-Provera Contraception Injection became the latest to join the list that also includes glucocorticoid medications, chemotherapy drugs for prostate and breast cancers, and SSRI antidepressants. The new black-box warning for Depo-Provera says that the drug causes bone density loss the longer the woman uses it and that this loss "may be clinically relevant." Because the bone loss cannot always be reversed, the FDA does not recommend that women who have other options use Depo-Provera as a long-term birth control method (e.g., longer than two years).

People who take glucocorticoid medicine (e.g., prednisone, prednisolone, dexamethasone, and cortisone) for more than three months also run the risk of osteoporosis, according to the American College of Rheumatology. Glucocorticoid drugs slow the rate of bone formation. They also "interfere with the body's handling of calcium and affect levels of sex hormones, leading to increased bone loss."

Androgen deprivation therapy, given to prostate cancer patients, is another treatment that increases the risk of osteoporotic bone fractures. Like glucocorticoids, the risk increases the longer the therapy is used. Despite the therapy's known effect on bones, few patients receive any screening, preventive care, or bone-loss treatment, according to Tawee Tanvetyanon, MD, Loyola University Chicago Stritch School of Medicine. ▶

## POLICOSANOL

from sugar cane extract

### A Natural Anti-Cholesterol Dietary Supplement

#### benefits

- Lowers total and LDL cholesterol without side effects
- Elevates beneficial HDL
- Inhibits the formation of lesions in arteries
- Keeps LDL from oxidizing
- Reduces inflammation-promoting thromboxane
- Inhibits abnormal platelet aggregation (a cause of arterial blood clotting)

10 Mg., 30 Vegetarian Capsules



1-800-524-3727

Royal Nutrition International • Anaheim, CA 92807

"These statements have not been evaluated by the Food and Drug Administration. This product is not intended to diagnose, treat, cure or prevent any disease."

# Shorts

Women who were pushed into early menopause by chemotherapy used to treat early-stage breast cancer showed unexpectedly high bone loss in a study published by the *Journal of Clinical Oncology* (15 July 2001). Doctors from Dana-Farber Cancer Institute, Brigham, and Women's Hospital in Boston found that some women who entered chemotherapy-induced early menopause "lost as much as 8% of their bone in just one year [about four times the normal postmenopausal bone loss]." The doctors halted their study early so that women could receive treatment to prevent further bone loss.

Most recently, bone loss in animal studies have raised concerns about the use of selective serotonin reuptake inhibitor (SSRI) antidepressants in adolescents and children. Lab studies have shown that serotonin pathways, which are hampered by SSRIs, are linked to bone growth. In an article by Stuart J. Warden, PT, PhD, et al. published in an online edition of *Endocrinology* (11 November 2004), bone development was measured in normal mice, normal mice who received Prozac early in life, and mice who were genetically bred to mimic SSRI exposure. Both the bioengineered mice and those who received Prozac developed narrower, less dense bones than the controls. Because peak bone mass develops during adolescence, this research indicates a potential need for caution in prescribing SSRIs to youngsters.

A human study, presented at the annual meeting of the American Society for Bone and Mineral Research (October 2004), linked SSRIs to bone loss in adults. The researchers found that mean bone-mineral density at the lumbar spine was 4.6% less among men taking SSRIs than for controls. In comparison, men taking glucocorticoids showed 2.9% less bone-mineral density than controls. Recognizing that depression is linked to other factors that contribute to bone loss (e.g., alcohol abuse, altered cortisol levels, etc.), the researchers also looked at participants who used tricyclic antidepressants or trazodone. The bone mineral density findings of men using these antidepressants did not differ significantly from controls.

Taking pharmaceutical drugs such as these is just part of the overall risk for brittle bones. Other recognized risk factors include old age; non-Hispanic white ethnic background; Asian ethnic background; small bone structure; family history of osteoporosis or osteoporosis-related fracture in a parent or sibling; previous fracture following a low-level trauma, especially after age 50; sex hormone deficiency; anorexia nervosa; cigarette smoking; alcohol abuse; low dietary intake or absorption of calcium and vitamin D; and sedentary lifestyle or immobility.

American College of Rheumatology. Glucocorticoid-Induced Osteoporosis. May 2001. [www.rheumatology.org](http://www.rheumatology.org)

Boyles, Salynn. Antidepressants May Affect Bone Growth. 11 November 2004. [www.ahs.health.webmd.com/content/Article/97/193972.htm](http://www.ahs.health.webmd.com/content/Article/97/193972.htm)

FDA issues Depo-Provera warning, testifies on HCB. 19 November 2004. [www.medicalnewstoday.com](http://www.medicalnewstoday.com)

Kim, Timothy F. Two studies link SSRIs to substantial bone loss. *Dr. Oz News* 1 December 2004

McKesson, L.A. Chemotherapy may cause some women to lose bone. July 12, 2001 <http://my.webmd.com>

Reuters Health. Bone loss drug overused in breast cancer patients. 2000 March 13. [www.personalund.com](http://www.personalund.com)

Stacy, Kelli Miller. Men Receiving Hormone Therapy Aren't Told About Prevention. Treatment. December 10, 2004. <http://my.webmd.com>

## Exercise & Osteoporosis

To create and maintain healthy bones, people must engage in physical activity. Mechanical stress, such as walking, stair climbing, weight-lifting, or hard physical labor, apparently causes calcium phosphate crystals in the bone to produce tiny electric currents. This piezoelectric effect stimulates bone-building cells (osteoblasts) to deposit more mineral salts to strengthen bones in the stressed areas. Without mechanical stress for a prolonged period, bone-resorbing cells (osteoclasts) will tear down unnecessary bone. Exercise encourages the secretion of calcitonin, a thyroid hormone that inhibits the bone-resorbing osteoclasts. In addition to strengthening muscle and promoting bone density, exercise improves balance and coordination, which decrease the risk of falling. Most fractures that afflict the elderly result from a combination of falling and brittle bones.

The Mayo Clinic staff recommends a combination of weight-bearing activities (e.g., walking, jogging, stair climbing), strength-training (e.g., weight-training, yoga), and back-strengthening exercises (e.g., pilates, yoga). Such a combination will promote bone density, strengthen muscles, and improve balance and coordination. Mayo Clinic recommends weight-bearing activity each day and strength training and back-strengthening exercises at least two and no more than four times a week. The staff warns against working the same back muscles on consecutive days.

People who already have osteoporosis need to seek the advice of a doctor or physical therapist who can design an appropriate strength training program. The Mayo Clinic says walking (at least a mile a day) is usually the best weight-bearing exercise for people with osteoporosis. Care should be taken when bending forward at the waist because such activities increase the risk of compression fractures in the spine. Activities that involve heavy lifting – including lifting bags of groceries and loads of laundry – should also be avoided. Twisting movements (common in golf or bowling) and the abrupt stops, starts, and weight shifts that occur during racket sports further stress the spine. Exercise programs have helped middle-aged and older women reduce their rate of bone loss and/or increase bone mass.

American Academy of Physical Medicine and Rehabilitation. How PM&R Physicians Use Exercise to Prevent and Treat Osteoporosis. [www.aapmr.org/condtreat/other/osteopor.htm](http://www.aapmr.org/condtreat/other/osteopor.htm)

Durak, Eric P. M. S. Exercise and Osteoporosis: A Primer on Tomorrow's Therapy. 1996. [www.healthnet.com/Article.asp?id=416](http://www.healthnet.com/Article.asp?id=416)

Mayo Clinic staff. Exercise and osteoporosis: staying active safely. September 24, 2004. [www.mayoclinic.com](http://www.mayoclinic.com)

## Ipriflavone

Ipriflavone (7-isopropoxyisoflavone) is a synthetic isoflavone derivative, used as a prescription treatment for osteoporosis in Italy, Japan, Argentina, and other countries. According to research (mostly from overseas), ipriflavone can inhibit bone breakdown, increase osteoblast activity, and reduce the pain of osteoporotic fractures. Susan E. Brown, PhD, CCN, who directs the Osteoporosis Education Project, has a very informative article about ipriflavone at [www.betterbones.com](http://www.betterbones.com). She found 31 human clinical studies on ipriflavone that were published in English from 1989 through April 2000. Of the 31, 18 studies were placebo-controlled. About half of the placebo-controlled studies show that ipriflavone increases bone density or reduces bone loss more effectively than calcium alone.

A multi-centered (Belgium, Denmark, Italy) three-year European study (IMEFS) reported less encouraging results at the American Society of Bone Mineral Research in Toronto in October 2000. In this study, 474 osteoporotic women with no prevalent vertebral fracture took ipriflavone and calcium or

Copyright of Townsend Letter for Doctors & Patients is the property of Townsend Letter Group and its content may not be copied or emailed to multiple sites or posted to a listserv without the copyright holder's express written permission. However, users may print, download, or email articles for individual use.