

**Alternative Therapies for
Osteoporosis:
Effects on BMD and Fracture
Risk**

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Alternative Medicine

- Alternative medicine ---sometimes called complementary medicine---- is rapidly growing in popularity.
- Surveys show that over 40 million Americans use some form of alternative therapy (nutritional supplements, herbs, meditation, prayer, acupuncture, Ayurveda, etc.)
- Why? Standard Western medicine does not have all the answers.
- NIH has responded to this overwhelming interest several years ago by opening a branch dedicated to alternatives: the National Center for Complementary & Alternative Medicine

Alternative Therapies

- In US, value of a drug is determined by large-scale, double-blind, placebo-based studies
- Many alternative therapies are naturally occurring substances; they cannot be patented
- No incentive for pharmaceutical companies to invest millions of dollars on clinical trials to determine effectiveness
- Numerous relatively small-scale studies on alternative therapies; many show promise. Pharmaceutical firms are testing some synthetic forms for their potential in treating various diseases.

Standard Preventive & Treatment Methods for Osteoporosis

- Adequate calcium Vitamin D
- Weight-bearing & resistance type exercise
- Avoiding smoking
- Avoiding excessive alcohol consumption
- Bisphosphonates: alendronate, risedronate, ibandronate, zoledronate
- Raloxifene Teriparatide Estrogen Calcitonin

Soy Isoflavones

- Soy contains phytoestrogens which act like mild estrogens (phytoestrogens in soy are called isoflavones)
- Receptors for estrogen are on both osteoblasts and osteoclasts
- Estrogen enhances calcium & phosphorus absorption and bone deposition
- Observational studies suggest that women who consume large amounts of soy have fewer fractures

Ipriflavone

- Laboratory-manufactured derivative of daidzin (substance found in soy)
- Used for many years in Japan and Italy to preserve bone strength and density in PMP women
- May encourage osteoblast action & discourage osteoclast action
- Some studies from Japan & Europe: ipriflavone can help slow bone loss rate

Vitamin K₂

- Factor discovered in fatty components of food in 1939 that aids in clotting of blood
- Vitamin K: really 3 related substances
 - K₁ (phylloquinone) found in plants
 - K₂ (menaquinones) produced in human digestive tract by bacteria
 - K₃ (Menadione) a synthetic variant

Strontium

- A naturally occurring mineral present in water and food
- Different from radioactive “strontium-90” formed by nuclear fission
- Trace amounts in human skeleton with affinity for bone
- Incorporated onto the crystal surface of bone
- Researched since 1950; recent findings: promotes bone formation and decreases bone resorption
- Supplemental forms: over 20 different compounds
- Strontium ranelate ~340 mg strontium/1 g compound

DHEA

- DHEA: dehydroepiandrosterone
- Most abundant hormone found in the human body
- Produced in the adrenals, ovaries, testes, brain & skin
- Regulates 18 or more other steroid hormones; increasing lean muscle mass, burning fat, and stimulating bone growth
- Converted in bone cells into estrogen (estrone), progesterone & testosterone
- Only (?) hormone that increases cellular activity of osteoblasts and also inhibits osteoclasts .S.LeVert, *The Promise of Eternal Youth* 1997
- Requires D₃ to form estrone; D₃ requires DHEA to stimulate osteoblasts
- Positive correlation between DHEA levels & BMD in women > 50
- DHEA levels decline with age, concurrent with onset of osteoporosis*

Natural Progesterone

- Manufactured in the laboratory from wild yams and soy beans; not to be confused with yam extracts sold in health food stores.
- Recommended for treating everything from menopausal symptoms, migraine, loss of libido and depression to water retention and fibrocystic breasts. Skepticism abounds in the health field; however, many women find it effective in bringing relief from premenstrual syndrome, menopausal symptoms, dysfunctional bleeding and endometriosis. Most information is anecdotal.
- Isolated studies since the 1970s have suggested a bone effect. Proof of protection against osteoporosis is lacking.
- In 1990, a study by John Lee, MD, generated excitement about 63 women who gained bone using Pro-Gest® cream.

Summary

- “In terms of osteoporosis prevention, the rules are that drugs must be shown to reduce the risk of fracture in properly designed, executed, presented, and interpreted clinical trials. If this is not done, the drug may well be efficacious, but the evidence is not there one way or another, so the decision of whether to prescribe the drug will be according to feeling-based medicine or opinion-based medicine but not evidence-based medicine.
- The studies must be double-blind, placebo controlled, involve large sample sizes and have few drop-outs, predefined primary end points, etc.
- The studies must be reproducible and consistent, done by different investigators in different parts of the world, with similar results observed
- The best studies follow most of the criteria mentioned; the best studies available are those of alendronate, risedronate, raloxifene, parathyroid hormone, and strontium ranelate. The quality of data for other drugs such as calcitonin, etidronate, menopausal hormone therapy, vitamin D metabolites, and calcium is not as compelling so that inferences are more difficult to make.”