Health Practitioners Protocol:  
**Osteoporosis**

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**Risk Factors and Detection of Osteoporosis**

The most prevalent bone disease is osteoporosis, where the body’s osteoclast action (absorption of bone) is faster than the body’s osteoblast action (production and deposition of bone). Approximately half of American women over the age of 50 will experience a fracture due to osteoporosis.

While a significantly smaller number of men over the age of 60 can experience fractures associated with osteoporosis, hip fractures in men are more than twice as likely associated with mortality.

**Risk Factors for Osteoporosis**

- Lack of exercise (especially confined to bed)
- Malnutrition (especially lactose intolerant)
- Menopause
- Alcohol abuse
- Smoking
- Genetic factors: family history, gene variations: COL1A1, IL6, VDR, and MTHFR (see Gene SNP™ Health Practitioners Guide)

Other causes: chronic rheumatoid arthritis, kidney disease, prolonged use of corticosteroids, some anti-seizure medications and hyperparathyroidism disorder.

A Bone Mineral Density test can be performed to calculate bone fracture risk and detect osteoporosis. Blood or urine tests can determine if osteoporosis is associated with other medical conditions.

**Nutraceutical Support for Osteoporosis/Osteopenia Protocol**

*Note: While dietary supplements are generally very safe and beneficial, patients should follow a few precautions. If they are pregnant, breastfeeding or taking prescription drugs, please counsel the client on the effects that supplement may have on their health. Ensure that the patient follows the label instructions on the bottle regarding dosage, and use caution if prescribing a different dosage.*

<table>
<thead>
<tr>
<th>Recommended Supplement</th>
<th>Purpose</th>
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<tbody>
<tr>
<td>1 Calcium or calcium-based supplement</td>
<td>To provide an optimal blend of calcium, vitamin D3, magnesium, vitamin C and boron, preferably in an isotonic solution that is readily absorbed by the body.</td>
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<tr>
<td>2 Vitamin D3 supplement; vitamin K2 supplement</td>
<td>To promote healthy calcium absorption and utilization.</td>
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<tr>
<td>3 Calcium-based supplement with B-complex vitamins, genistein and inulin</td>
<td>To help prevent osteoporosis, support calcium absorption and retention, maintain bone density and support normal mineralization and bone formation.</td>
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</table>
## Micronutrient Description and Extrapolation

<table>
<thead>
<tr>
<th>Micronutrient</th>
<th>Description</th>
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<tbody>
<tr>
<td>Calcium</td>
<td>Calcium is a major structural element in bones and teeth.</td>
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<tr>
<td>Vitamin D3</td>
<td>Enhances cellular absorption of calcium. Promotes calcium uptake into bones by stimulating the induction of calcium-binding proteins, enhancing calcium ion absorption via those channels. Helps maintain serum calcium within a normal range. Promotes normal mobilization of stem cells to become osteoblasts.</td>
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<tr>
<td>Vitamin K2</td>
<td>Promotes the synthesis of proteins involved with calcium utilization, thereby supporting bone retention and arterial health.</td>
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<tr>
<td>Genistein</td>
<td>Helps maintain bone density when estrogen levels decline. Supports the activity and the lifespan of osteoblast. Supports the normal production of Type 1 collagen, a bone matrix protein.</td>
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<tr>
<td>Inulin (FOS)</td>
<td>Promotes the growth of beneficial colonic bacteria which facilitates calcium and magnesium absorption.</td>
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<td>Vitamin C</td>
<td>Critical cofactor in the normal synthesis of collagen matrix of bone.</td>
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<tr>
<td>Magnesium</td>
<td>Promotes healthy bone mineral density when taken with calcium. A component of the mineralized portion of the bone necessary for the metabolism of potassium and calcium in adults, as well as the mobilization of calcium from the bone.</td>
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<tr>
<td>Boron</td>
<td>Cofactor for activation of Vitamin D3. Promotes healthy calcium uptake into bones.</td>
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<tr>
<td>Manganese</td>
<td>Essential for enzymatic activity required for healthy bone formation. Manganese levels are lower in women with osteoporosis.</td>
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<tr>
<td>Folic Acid</td>
<td>Promotes healthy homocysteine levels. Promotes energy production and the formation of red blood cells.</td>
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<tr>
<td>Vitamin B12</td>
<td>Promotes healthy homocysteine levels. Promotes healthy cell formation and cell longevity.</td>
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<tr>
<td>Riboflavin (B2)</td>
<td>Serves as a co-enzyme, working with other B vitamins.</td>
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<tr>
<td>Potassium</td>
<td>Neutralizes bone-depleting metabolic acids; serves to adjust the osmolality of nutrient solutions.</td>
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## Dietary Recommendations

Vitamin K is a fat-soluble vitamin found meat, eggs, dairy and natto. Phylloquinone (vitamin K1) is the major dietary form of vitamin K. Foods such as spinach, parsley, broccoli and kale contain vitamin K.

Not all calcium consumed is actually absorbed in the gut. The highest concentration of calcium is found in milk. Other foods rich in calcium include vegetables such as collard greens, Chinese cabbage, mustard greens, broccoli and tofu. Calcium absorption from milk is about 28 percent; absorption from kale is about 41 percent.

More than 50 percent of postmenopausal women taking medication for osteoporosis have suboptimal levels of vitamin D. Without adequate vitamin D, only 10–15 percent of dietary calcium is absorbed. Dietary sources for D include: salmon 360 IU; mackerel 345 IU; tuna 200 IU; sardines 250 IU; and fortified milk; 98 IU.

Food sources of inulin include asparagus, leek, onions, banana, wheat and garlic. Higher concentrations are present in herbs such as dandelion root, elecampane root and chicory root.

Isoflavones are found in small amounts in legumes, grains and vegetables; however, soybeans are the most concentrated source. Recent surveys suggest that average dietary isoflavone intakes in Japan, China and other Asian cultures range from 25–50 mg per day while in Western cultures studies have found intakes to be as low as two mg per day. Traditional Asian foods made from soybeans include tofu, tempeh, miso and natto. Edamame refers to varieties of
soybeans that are harvested and eaten in their green phase. Soy products popular in Western cultures include soy-based meat substitutes, soy milk, soy cheese and soy yogurt.

Individuals with certain variations of “bone health” genes have an increased requirement for calcium and vitamin D, which are needed to maintain bone health and healthy bone mass. It is vital that these individuals include plenty of calcium-rich foods in their diet, as well as foods rich in vitamin D.

Certain variations in “bone health” genes make the bones less tolerant of caffeine. It is important that individuals with these variations keep their caffeine consumption to a minimum, below the recommended upper limit of 300 milligrams a day.

It is clear from the body of nutrition data that most people are unable to practically obtain the entire vitamin, mineral and metabolite requirements from their diets alone.

Lifestyle Recommendations

Regular exercise can reduce the likelihood of bone fractures in people with osteoporosis. Some of the recommended exercises include:

• Weight-bearing exercises: walking, jogging, tennis, dancing
• Resistance exercises: free weights, weight machines, stretch bands
• Balance exercises: tai chi, yoga
• Riding a stationary bicycle
• Rowing machines

If you are a smoker, consider quitting. Also limit alcohol intake. Too much alcohol can damage your bones, as well as put you at risk for falling and breaking a bone.

Monitoring Patients at Risk for Osteoporosis

Serum tests for vitamin D should look for 25-hydroxycholecalciferol and 32-100 ng/mL is the normal range. Patient’s response to treatment can be monitored with bone mineral density measurements taken every six months. Women taking estrogen should have routine mammograms, pelvic exams, and Pap smears.

Potential Interactions

Supplements containing calcium and magnesium decrease absorption of bisphosphonates. Advise patients to take bisphosphonates at a different time of day.

Patients that have had renal failure, estrogen-sensitive cancer or hypothyroidism should avoid soy preparations.

Because there is insufficient reliable information about the effects of soy preparations in patients with breast cancer, a history of breast cancer, or a family history of breast cancer, therapeutic use of soy should be done with caution in these patients.

High intake of soy seems to lower parathyroid hormone levels in postmenopausal women. Soy might worsen hypothyroidism and increase TSH levels. Soy seems to inhibit thyroid hormone synthesis, resulting in increased secretion of TSH in some postmenopausal women. Vitamin D may increase calcium levels in people with hyperparathyroidism.

Women who are pregnant or breastfeeding should not use soy preparations or supplemental vitamin D. Theoretically, therapeutic use of soy might adversely affect fetal development.

Some people can experience severe allergic reactions to inulin-containing foods.
In patients with end-stage renal disease (ESRD) phytoestrogens in soy may reach higher plasma concentrations, increasing the risk for toxicity.

Hypercalcemia can contribute to arteriosclerosis, particularly in patients with kidney disease. Use supplemental vitamin D cautiously. Vitamin D may increase calcium levels and increase the risk of arteriosclerosis in renal failure. Vitamin D toxicity can lead to hypercalcemia which can lead to kidney insufficiency. Anyone with renal failure is advised to monitor vitamin D and calcium intake.

Certain medical conditions, such as primary hyperparathyroidism, sarcoidosis, tuberculosis and lymphoma can increase the risk of hypercalcemia in response to vitamin D. If you have any of these specific conditions, you should not take supplemental vitamin D.

Suggested Further Reading

http://ods.od.nih.gov
http://naturaldatabase.therapeuticresearch.com
http://www.nutrametrix.org/nei/
Gene SNP™ Health Practitioners Guide (UnFranchise® downloads)
Natural Medicines Comprehensive Database (prescription information)

References

Supporting calcium, genistein, inulin and B-complex vitamin supplements
Supporting calcium–based supplements


Supporting vitamin D3 and vitamin K2 supplements