



## Building Better Bones

How to help and prevent osteoporosis naturally

### Osteoporosis defined:

- **Osteoporosis:** Literally means “porous bones”, it is a progressive reduction in normal bone mineral density, mass, and strength, resulting in marked bone thinning and vulnerability to fracture
- **Osteopenia:** The presence of less than normal amount of bone. Osteopenia may result in osteoporosis if not treated
- **Osteomalacia “soft bones”:** A failure to mineralize the bone matrix, resulting in a reduction of the mineral content of the bone. Also known as adult rickets

### Osteoporosis facts:

- An estimated 1.5 million fracture per year stems from osteoporotic nature. Women account for 71% of the fracture per year. (50% spine, 25% wrists, 25% hip)
- Approximately 10 million people have osteoporosis
- Another 34 million have osteopenia
- Hip fractures are associated with a higher risk of death
- Osteoporosis quadruples your fracture risk
- By 2020, 1 in 2 Americans 50+ year-olds will be at risk for fractures from osteoporosis or low bone mass

**FYI:** Although bone mass normally declines 1.5% - 2% per year in both sexes, after age 40, women are at greater risk for osteoporosis since their peak bone mass is naturally less than half of that of men due to smaller size and muscle mass.

### Osteoporosis - Major risk factors:

- Family History of osteoporosis
- White or Asian descent
- Small body frame
- Postmenopausal - causes decrease estrogen and progesterone
- Hysterectomy
- Inadequate calcium, vitamin D, and other nutrient intake
- Excess protein intake in the diet
- Inadequate exercise - weight-bearing exercise stimulates osteoblasts
- Smoking
- Excessive alcohol consumption
- High intake of caffeine, carbonated beverages, and salt
- Long-term glucocorticoid therapy
- Long-term use of anticonvulsants, antacids
- (Carbonated drinks containing phosphorus (acid) which neutralizes calcium (alkaline) )
- (Phosphorus counteracts calcium supplements and de-calcifies bones)

### Osteoporosis - It's Never Too Early or Too Late to Think about Prevention:

- Prevention - the most effective method of dealing with osteoporosis
- Approaches to prevention:
  - maximizing peak bone mass at skeletal maturity
  - reducing the rate of age-related bone loss

### Osteoporosis - Detection:

- The Bone Mineral Density test (BMD) - best way to diagnose osteoporosis

- Provides early detection. The “gold standard” for bone densitometry is Dual Energy X-ray Absorptiometry, or DEXA (T + Z scores)

World Health Organization Definitions of Osteoporosis Based on Bone Density Levels	
Normal	Bone density is within 1 SD (+1 or -1) of the young adult mean
Low Bone Loss	Bone density is 1 to 2.5 SD below the young adult mean (-1 to -2.5 SD)
Osteoporosis	Bone density is 2.5 SD or more below the young adult mean (> -2.5 SD)
Severe (established) osteoporosis	Bone density is more than 2.5 SD below the young adult mean and there has been one or more osteoporotic fractures

**Prescription Meds Target Bone Remodeling - Results May Be Undesirable and Ineffective:**

- ❶ **Hormone Replacement Therapy (HRT).** Potentially dangerous for those at risk to hormone sensitive cancers; long-term use during asymptomatic menopause may be associated with increased CVD risk
- ❷ **Selective Estrogen Response Modifier (SERMs).** Used where HRT is contraindicated; while effective, have been associated with thrombo-embolic disease in clinical trials
- ❸ **Bisphosphonate Drugs.** Known to promote poor bone quality, atrial fibrillation; and 30% cannot tolerate due to GI side effects

**Osteoporosis - Supplemental Recommendations:**

- Calcium: 1,500 mg over 50 per day
- Magnesium: 600 - 800 mg per day
- Vitamin D: 200 - 400 mg per day
- Boron: 3 - 5 mg per day
- Ipriflavone: 600 mg per day
- Silicon: 5 - 20 mg per day
- Zinc: 20 mg per day
- Copper: 2 mg per day
- Manganese: 2 mg per day

A study reported in the N.E. Journal of Medicine by Reid, et al, demonstrated a 43% reduction in bone loss in postmenopausal women who supplemented their regular diets with a 1000mg of calcium for 2 years, compared to postmenopausal women receiving placebos

**Osteoporosis - Supplemental Recommendations:**

- Calcium - What are the recommended levels?
  - A recent study recommended that the RDA during childhood should be 1,250 mg and 1,450 mg during adolescence, while another study recommended a calcium intake of up to 1,800 mg/day during adolescence
  - The National Institutes of Health (NIH) Consensus Conference on Optimal Calcium Intake recommends calcium intakes of 1,200 to 1,500 mg for 11 - 24 year olds, 1,000 mg for those 25 - 50 years, and 1,500 mg for those over 65. In addition, the NIH recommends a calcium intake of 1,500 mg/day for women over 50 years who are not receiving hormone replacement

Types of Calcium Supplements: Their Advantages and Disadvantages		
Types	Advantages	Disadvantages
Microcrystalline Hydroxyapatite Concentrate	<ul style="list-style-type: none"> <li>• Well absorbed calcium source</li> <li>• Comprehensive bone nourishment</li> <li>• Provides organic constituents and mineral components</li> </ul>	None
Calcium Citrate	<ul style="list-style-type: none"> <li>• Well absorbed</li> <li>• Reduces risk of kidney stones</li> </ul> <p>Absorbed by those with poor digestion</p>	Not a complete bone food
Calcium Carbonate	<ul style="list-style-type: none"> <li>• Cheapest source of calcium</li> </ul>	<ul style="list-style-type: none"> <li>• Not a complete bone food</li> <li>• May be malabsorbed by those with poor digestion</li> <li>• Antacid effect, may interfere with digestion, cause gas</li> </ul>

### Best Form of Calcium

(MCHC) Microcrystalline hydroxyapatite concentrate:

Study of osteoporotic postmenopausal women, with the complication of primary biliary cirrhosis, showed that MCHC supplementation not only helped reduce bone loss but it actually helped increase cortical bone thickness by 6.1%

- Magnesium:
  - Magnesium depletion affects all stages of skeletal metabolism adversely, causing cessation of bone growth
- Vitamin D:
  - Vitamin D deficiency associated with increased risk of hip fracture, studies demonstrated that an increase in calcium intake of 800 - 1,000 mg/day with supplementation of 400 - 800 units of vitamin D will decrease the risk of vertebral and non-vertebral fractures and increase bone mineral density
- Ipriflavone:
  - Numerous double-blind, placebo- controlled studies have shown a positive effect of ipriflavone in reducing bone mineral loss and increasing bone mineral density in postmenopausal women with osteopenia or established osteoporosis at a dose of 600 mg/day
- Trace minerals:
  - Studies have shown that trace mineral deficiencies can impair bone formation and resorption. In a 2-year clinical study, postmenopausal women who received calcium supplements together with zinc, copper, and manganese experience a gain in bone mineral density while women receiving calcium alone, trace minerals alone, or a placebo, experienced increasingly greater losses in bone mineral density

### Osteoporosis - Dietary Recommendations

- Limit dietary factors that promote calcium excretion:
  - salt, sugar, animal protein, soft-drinks, alcohol and coffee
- Eat calcium-rich foods:

- in addition to dairy products, good non-dairy sources of calcium include kelp, bok choy, spinach, greens (collard, mustard, turnip), nuts and seeds (sesame seeds, almonds, chestnuts, walnuts), and beans (garbanzo, soy, tofu)
- cabbage family plants (kale, collards) have very absorbable calcium
- Eat green leafy vegetables:
  - kale, collard greens, parsley, and lettuce (except iceberg): high in calcium, vitamin K and boron
- Eat magnesium-rich foods:
  - wheat bran, wheat germ, almonds, cashews, blackstrap molasses, Brewer's yeast, buckwheat, English walnuts, brown rice

### Osteoporosis - Exercise

- Exercise is the key component to good bone health. The best exercise for your bones is a weight-bearing form of exercise, such as, but certainly not limited to:
  - Walking
  - Stair-climbing
  - Treadmill
  - Biking
  - Racquet sports
  - Swimming
  - Light-weight or strength training

