

Osteoporosis: The Risks and Treatment Options

According to the National Osteoporosis Foundation (NOF), it is estimated that 10 million Americans (80% of them women) have osteoporosis (severe bone loss with a high risk for bone fracture) and an additional 18 million have osteopenia (moderate bone loss). Once men reach age 65-70 bone mass loss occurs at the same rate as women, and 1/3 of all hip fractures each year occur in men. Bone is a dynamic tissue and is constantly being removed (reabsorbed) by cells called 'osteoclasts', while cells called 'osteoblasts' are forming new bone. After age 30, bone re-absorption gradually starts to exceed bone formation leading to a lower bone density. By the time women are in their 80's, 50% will have osteoporosis in one or both hips. Vertebral (spinal) fractures lead to chronic pain, disability and height loss. Hip fractures are associated with increased risk of hospitalization, long-term disability and death.

Risk factors for Osteoporosis Include:

- Age (50 yrs and over)
- Cigarette smoking
- Low body weight
- Personal history of bone fracture
- Family history of osteoporosis or hip fracture
- Caucasian or Asian heritage
- Long-term (>6 months) steroid therapy (severe asthma or arthritis)
- Estrogen deficiency occurring with menopause
- Alcoholism / Drug use
- Inadequate physical activity
- Malabsorption disorders (IBS, eating disorders, stomach stapling)
- Inadequate calcium intake

Determination of Bone Density:

Bone mineral density ('BMD') is measured by a precise, accurate and extremely low radiation machine called a **DEXA** (dual-energy x-ray absorptiometry). When the BMD is measured, it is compared to a healthy young adult of the same sex and is reported as a "T-score". If the T-Score is 10% to 25% below the average for a healthy young adult, osteopenia is present.

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|---------------------------------------|-------------------------------------|
| <input type="checkbox"/> Normal | T-score is above 0 to - 1.00 |
| <input type="checkbox"/> Osteopenia | T-score is between -1.00 and - 2.50 |
| <input type="checkbox"/> Osteoporosis | T-score is lower than - 2.50 |

Preventive and Treatment Measures:

- Calcium: 1200 mg/day through diet and/or supplements.
- Calcium Carbonate should be taken with food
- Calcium Citrate and Calcium Phosphate can be taken at any time of the day.
- Vitamin D3: 1000 I.U./day; Increases absorption of calcium into bone.
- Weight bearing exercise: Weight bearing means exercise in which bones and muscles work against gravity as the feet and legs bear the body's weight. This may include walking, jogging, stair climbing, dancing and tennis. Weight lifting improves muscle mass and bone density.
- Avoid smoking, excessive alcohol intake, carbonated drinks, and excessive caffeine intake.

Medical Treatment of Osteopenia (T-scores < -2.0) and Osteoporosis:

- 1) **Estrogen therapy** is preventive by reducing progressive postmenopausal bone loss and decreasing the risk of vertebral (spine) fractures. Long-term estrogen replacement (over 10 years) has not demonstrated any increased risk of breast cancer. Data supports beneficial cardiovascular effects of estrogen replacement when started early in menopause.
- 2) **SERMS –Selective Estrogen Receptor Modulators**
 - a. Raloxifene (“**Evista**”):
 - i. 2nd Generation SERM used to prevent and treat bone loss.
 - ii. Evista reduces the risk of spinal fractures by 35-60%.
 - iii. Cardiovascular benefit as cholesterol levels may be improved.
 - iv. Does not increase the risk of breast or uterine cancer.
 - v. Possible side effects include hot flashes, leg cramps and rarely, blood clots.
 - d.. **Bazedoxiphene**
 - i. New 3rd Generation SERM
 - ii. FDA approved combined with conjugated estrogen for menopausal symptoms (**Duavee**)
 - iii. FDA approval for treatment of osteoporosis is pending
 - iv. Bazedoxiphene is approved in Europe for treatment of severe osteopenia and osteoporosis for patients who do not take others forms of medications (e.g. Bisphosphonates, Prolia, etc.).
 - v. When used with estrogen for HRT (Duavee), it replaces **progesterone**, as it protects the uterine lining (endometrium) from growing and eliminates uterine bleeding.
 - vi. Also has a protective effect on breast tissue, similar to “**Tamoxifen**” (1st Generation SERM) used for prevention of breast cancer)
- 3) **Bisphosphonates:**
 - a. Used to treat bone loss by inhibiting bone breakdown and therefore increases bone density.
 - b. Types of medications:
 - i. **Fosamax** (Alendronate)-Daily or weekly, oral
 - ii. **Actonel** (Risedronate)-weekly or monthly, oral
 - iii. **Boniva** (Ibandronate)-monthly, oral or intravenously every 3 months
 - iv. **Reclast** (Zoledronic Acid)- yearly intravenously
 - c. A common side effect of this class of drug is irritation of esophagus.
 - d. Rare cases of osteonecrosis (destruction of bone tissue) of the jaw or non-traumatic fracture of thigh bone (femur) have been reported, but have not been shown to be due to these medications. As a precaution, I recommend discontinuing the medication one month prior to a tooth extraction, implant or root canal. The medication may be resumed one month after the procedure.
- 4) Denosumab (**Prolia**)
 - a. FDA approved for treatment of postmenopausal osteoporosis.
 - b. Decreases osteoclastic activity of bone reducing the incidence of vertebral, non-vertebral, and hip fractures
 - c. Administered by injection every 6 months
 - d. Important that blood calcium and Vit. D levels are normal
 - e. Report possible side effects are primarily musculoskeletal pain (back and extremities)

References:

- National Osteoporosis Foundation <http://www.nof.org>
- Osteoporosis and Related Bone Disease, National Resource Center <http://www.osteoporosis.org>
- U.S. Dept. of Agriculture (USDA) Food and Nutrition Information Center <http://www.nal.usda.gov/fnic>