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## **Bone Health for Women and Men**

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### **Introduction**

I want to shed some rational light on this whole, controversial issue. Broken hips are a significant problem for the very old. Elderly nursing home residents that break a hip often die within a year — the most susceptible are elderly men and women that frequently fall, eat poorly, experience weight loss and in a general state of decline. **In the U.S. the median age for a fractured hip is 84. For the newly menopausal woman in her 50s, suffering from bone fractures is not an issue.** The solution involves a holistic approach to health and aging. No long-term studies have shown that giving a medication for strengthening bones to someone in their 50s offers the same benefit for a person in their 80s. Some studies indicate that after a few years of stopping a medication, the benefit gained will disappear. This is why drug companies study Bone Mineral Density (BMD) instead of fractures. The fracture rate of women (even in their 60s) is very low — it is almost impossible to prove that taking drugs for bone health would provide any actual health benefit.

Let's take a look at how we can keep bones healthy.

### **Normal bone health**

As we grow, our bones get bigger and stronger and peaks at around age 30. It slowly declines and over time the bones become thinner. Bones are formed from a protein matrix, made strong by a calcium and phosphate matrix that is built onto the protein matrix. The spine is mostly straight up and down, constantly withstanding compression forces. Hips are positioned at an angle and must be able to endure constant twisting and bending. Protein for flexible strength is just as important as calcium is for compression strength.

### **Wear and tear and repair**

Just living and doing everyday tasks can cause tiny microscopic breaks in our house bones. Walking and exercise (such as weight bearing) causes tiny, microscopic breaks to occur. Bone cells called osteoclasts takes away a little bone around the break. Other cells called osteoblasts then follow up to repair the damage. Estrogen slows the rate at which the osteoclasts remove bone. Progesterone and testosterone stimulate the osteoblasts to make the repair and healthy bones require both to restore the tiny cracks. Women in their 40s frequently lose most of their progesterone because they ovulate less often. Men

still make testosterone, but that also slowly weakens. Repairs are not made as well (as opposed to younger people) and bone strength declines (at a more rapid rate in women versus men of the same age). With the onset of menopause, estrogen deteriorates rapidly. Without the inhibition of estrogen, osteoclasts remove bone at a more rapid rate, accelerating bone loss. Having thin bones along with a significant reduction of calcium is called osteoporosis (“bones with holes”). This can be tested using a special X-ray (DXA scan), and measures BMD (Bone Mineral Density). A lesser loss of bone compared to an average 30 year old is called osteopenia (“smaller bones”).

### **Stress**

When we are under stress, the adrenal glands produce higher amounts of a hormone called cortisol. **Cortisol affects the thyroid, sex hormones, immune system, fat storage, brain function and bones.** Cortisol hits the same osteoblast bone receptors that are stimulated by progesterone and testosterone, but blocks their effect, causing the bone to repair poorly. This can increase the trend toward osteoporosis. People who take cortisone drugs for long periods of time can also get osteoporosis.

### **Effects of aging**

After the age of 30, we slowly start to lose bone, which contributes to shrinkage of the spine for aging men and woman. It also increases curvature of the spine. The World Health Organization (WHO) defines osteoporosis as a BMD of less than T-2.5 and osteopenia as BMD of T-1.0 to T-2.5. By that definition, 13% - 18% of white American women 50 and up would have osteoporosis of the hip. **Osteoporosis is defined by a low BMD — however, most postmenopausal women with fractures do not have bone density values consistent with osteoporosis based on WHO criteria.** Again, the biggest danger for breaking a hip is due to older people falling. As stated earlier, the median age for hip fractures is 84 and will probably get higher as the population lives longer and becomes healthier into old age. Currently, these numbers are based on women in their 80s. Today's 50-year-old is much healthier than their parents were at the same age, more active, maintains healthier eating habits, and has better teeth (vital for maintaining better nutrition).

### **Risk factors for osteoporotic fracture:**

- Advanced age
- Low BMD
- Prior adult fractures
- Parent had a hip fracture
- Extreme thinness
- Current smoker
- Low calcium or Vitamin D intake
- Consume more than two alcoholic drinks per day
- Cortisone treatment for an extended period of time

### **Increased risk for falling:**

- Impaired vision
- Dementia
- Poor health or frailty
- Low physical activity
- History of a recent fall

Most of these risk factors relate to mental and physical decline of the elderly. Weight loss frequently becomes a problem because of the inability to eat and process needed nutrition.

**Maintenance — the key to a life of strong bones is living a healthy lifestyle:**

- Balanced diet high in vegetables
- Modest intake of fat and protein
- Active lifestyle with regular exercise (including aerobic and weight bearing to help maintain balance and muscle tone)
- No smoking or heavy drinking

**A nutritional supplement program with a basic multivitamin and mineral formula including:**

- Minimally 1000 IU of Vitamin D (4,000 IU might be better)
- 500 to 1000 mg of calcium plus half that amount of magnesium (can be purchased in a single tablet)
- Extra Vitamin C (500 – 1000 mg)
- One capsule of fish oil or flax seed oil

**Note:** Adequate Vitamin D levels and stomach acid are needed for the body to absorb calcium. Medications that inhibit stomach acid (e.g., Nexium and Prilosec) prevent calcium from being absorbed. Since bone is built during sleep and magnesium can be a sedative, it is ideal to take calcium/magnesium before bed.

**Hormone Replacement Therapy (HRT)**

As stated above, natural hormones protect our bones. Estrogen slows the rate that the osteoclasts remove bone while progesterone and testosterone stimulate the osteoblasts to repair and build new bone. Many studies show that taking HRT in menopausal years slows down bone loss and reduces fracture rates. However, once HRT is stopped, significant bone loss reoccurs. For men, testosterone turns into estrogen (they also need some estrogen to protect their bones).

**Pharmaceuticals**

There are several medication categories used for osteoporosis besides HRT. Bisphosphonates (e.g., Fosamax, Actonel and Boniva) work like a super estrogen to stop osteoclasts from removing bone. Although they increase BMD, long-term effectiveness for preventing fractures is less clear. These drugs virtually halt all bone repairs and there is some concern that after taking for more than a few years, bones may actually become more brittle, fracture easier and heal at a slower pace. There are very few studies lasting over five years. SERM drugs such as Raloxifene (Evista) help bones in a way similar to estrogen. As an estrogen antagonist, they can make hot flashes worse and increase vaginal dryness. Evista can cause more blood clots than oral estrogen. The parathyroid hormone and calcitonin are natural hormones that stimulate bone growth — they require injections or nasal sprays and are very expensive. Few long-term studies have been done or conducted to compare these therapies or hormone supplements for antifracture efficacy as virtually all studies compare drugs to a placebo.

### **The pharmaceutical dilemma**

Although BMD measurement is recommended for women over 65, many recent menopausal women in their late 40s and early 50s are getting bone DEXA scans done. If BMD is a little low, many women have already started on medications. Even if a fracture is slated in a woman's future, most likely it would not happen for another 25 to 35 years. There are no studies showing that taking medication in your 50s will be of any benefit 30 years later. Although natural hormone replacement helps keep bones strong, that is not the only (or most important reason) that most women take hormones. Long-term use of bisphosphonates possibly could make bones more brittle and susceptible to hip fracture. These drugs are helpful in elderly woman — who are at a greater medical risk to start taking estrogen — but we still don't have a good picture of what 30 years of use might do. Currently, my bone protection plan includes female HRT, male hormone supplements, a healthy diet, vitamins, minerals and exercise.