

OSTEOPOROSIS (OP) PREVENTION THROUGH LIFESTYLE CHANGES:

Bone health is a careful balance of making new bone and breaking down old bone. Diet and life style factors such as exercise affect this balance.

Our peak bone mass occurs around age 30. That peak depends on genetics as well as nutrition and activity. After 30, bone loss progresses as we age, as bones become more brittle, the risk of breaking easily with minimal trauma increases, these fractures are called fragility fractures. When bones are brittle they break easily AND don't heal as well. **There are no symptoms related to bone loss until after a fracture has occurred!**

Diagnosis of bone loss: Bone density scan is called a DEXA. The US Preventive Services Task Force recommends:

- All women age 65 and older
- Age < 65 if you are at increased risk (see below)
- It is very rare to recommend DEXA before menopause (assessment of risk is not accurate)
- Frequency of repeating DEXA: Typically no more than every 2 years. If DEXA is normal, the risk of progressing to osteoporosis in 15 years is 10-15%.

Definitions: DEXA definitions of Osteopenia and Osteoporosis:

T score > -1 normal
-1 to -2.5 osteopenia
< -2.5 osteoporosis

Who is at risk: 40% of American women have an OP related fracture in their lifetime (hip, spine, wrist, rib). Most women do not think they are at risk. The risk is increasing because women have lower peak bone mass because young American women are not getting enough calcium, vitamin D and other important nutrients, they are eating fewer veggies (should have 5-10 serving/d), drinking less dairy, more processed foods AND drinking sodas AND less exercise! ***We need to include our children in any changes we make!***

Complications of Osteoporosis:

- Hip fracture: 20% of women die in the 1st year from complications and the chance of returning to pre-fracture activity level is only 40%.
- Spine fractures: chronic pain, loss in height, "buffalo hump", decreased lung volume causing more lung infections.

Timing of Bone Loss? Bone mass peaks in our early 30's then slowly declines. Then rapid loss starts ~ 2 yrs before menopause. Typical loss around menopause is ~1% of total bone mass per year, some women lose 3-5% of their bone mass per year, that's a lot!

RISK FACTORS: Mark your risk factors

- Personal history of broken bone as an adult with mild trauma.*
- Increasing age, especially age > 65.*
- Family history (mother, father, or sibling) of osteoporosis, greatest risk - mother with a hip fracture.*
- Low peak bone mass: you didn't make enough bone as a child, risk factors: anorexia, excessive exercise as a child

(especially if you had fewer periods), being sedentary, starting your period late.

- Lifestyle or environmental factors:
 - Smoking
 - Alcohol >1 drinks/day
 - Getting little or no weight-bearing exercise.
 - Thin body, weight < 127
 - Sedentary lifestyle (low activity, desk job)
 - A diet low in nutritious foods containing calcium, phosphorus, and vitamin D, low intake of veggies
 - Diet high in processed foods
 - Early menopause (age < 45)
 - Health conditions: see list under prevention section
 - Medications: see list under prevention section
 - European or Asian ancestry.

***Most important risk factors**

PREVENTION: Why prevent when there are meds to treat? All meds have risks and they don't result in normal bone strength, they stabilize loss and if you are on them too long, actually increase the risk of breaking bones. The best way to build bone and prevent loss is lifetime nutritious diet, exercise, stress mgmt and manage medical problems.

Review the following to determine your plan for change. (Mark the ones you need to address)

- Exercise:** stronger muscles and better balance will reduce falling and breaking bones
 - Weight bearing exercises (walk, run, aerobics) 3-5x/wk 30-45min 3-5x/wk
 - Strength/muscle building exercises (2-3x/wk) include upper body
 - Exercises for balance, posture and core (2-3x/wk)
 - Weighted vests - help build upper body strength
 - www.nof.org for examples of exercises
- Eliminate tobacco
- Avoid falls (correct vision and hearing, review meds that affect balance, remove safety hazards in the house (good lighting, handrails, remove obstructions, avoid throw rugs)
- Nutrition:** When it comes to bone health, we typically think of calcium and vitamin D, however there are many more nutrients that are important for bone health.
 - Diet: best way to eat for your bones: plant based, whole food, anti-inflammatory diet
 - 7 day food diary to assess your diet (most people overestimate their intake of veggies and underestimate their intake of processed foods)**
 - variety of veggies and fruit daily (5-10/day), eat a variety of colors will improve the variety of nutrients you eat (nutrients absorb better from your diet than from supplements)
 - Healthy protein source at every meal (~80 gm/d)
 - Add fiber (~30 gm/d) 2 T of ground flax daily
 - Healthy fat (olive oil, avocado, nuts) daily. Avoid sodas and limit caffeine.
 - Decrease alcohol: < 2 drinks/d
 - Avoid sodas
 - Decrease caffeine

○ Vitamins/Supplements:

□ **Calcium:** 1000 mg/day. This is a total recommendation based on dietary intake and supplements. Typical diet is inadequate. Stay below 2000/day in supplements because of increased risk of heart disease and kidney stones. Most people absorb 500 mg of calcium from a supplement at a time. Since bone health depends on a complex process, **Calcium by itself or only with vit D will not decrease the risk of breaking a bone.** Taking magnesium with calcium can minimize constipation and help with bone health (2:1 ratio, ex Ca 1200 +magnesium 600).

□ Estimate your daily calcium intake. Average calcium intake ~400-500/d. You can google your intake to get a more precise amount.

- Dairy (milk, yogurt, cheese): ~250-300mg/serving
- Beans/bean products (tofu made with calcium, beans): ~40-100mg/serving
- Nuts/seeds (almonds, almond butter, Brazil nuts): ~50-90mg/serving
- Canned meats (sardines, salmon with bones, oysters): ~60-350mg/serving
- Fruit (orange): 55 mg
- Non dairy drinks (calcium enriched OJ, fortified soy or rice beverage) 300 mg/cup
- Veggies cooked (turnip greens, bok choy, okra, kale, broccoli): 35-95/half cup, Spinach: 120mg/half cup

□ **Vitamin D3:** 1000-2000 IU/day. Vit D helps your body absorb calcium. Fish, liver, and egg yolk are the only foods that naturally contain vitamin D. Most women are low in vit D, your vitamin D level can be checked to help determine your need. Your body will make vit D if you are in the sun for 20-30 minutes during the day without suntan lotion. Do not take more than 5000 IU/day without a doctor's recommendation. Vitamin D by itself doesn't prevent breaking bones.

□ Estimate daily intake from food.

- Milk: 100 IU/cup
- Fortified rice or soy beverage: 100 IU/cup
- Canned pink salmon: 530 IU/3 oz
- Canned light tuna: 200 IU/3 oz

□ Sun: 20-30 min/d outside without suntan lotion

□ **Soy:** may help, consider 90 mg per day of isoflavones.

□ **Magnesium:** 400-800 mg/d, may help increase BMD & reduced fracture rates.

□ **Boron:** 1-3 mg/day. Reduces urinary losses of calcium and magnesium, increases estradiol and testosterone levels, may help convert vitamin D to its active form

□ **Vitamin K1 & 2:** 100-500 mcg/day, may enhance mineralization of bone (avoid if on blood thinner)

□ **Prebiotics and Probiotics** - help absorb nutrients more effectively

□ **Potassium:** helps calcium absorption

□ **Zinc:** 10-30 mg/day, may enhance vitamin D activity

□ **Vitamin B6:** 5-50 mg/day

□ **Supplements:** supplements for bone health are in addition to getting nutrients in a healthy diet (these are only suggestions, there are other options available)

- Perque BoneGuard Forte
- MegaFood BoneHealth
- Orthomolecular Osteoprev - bone health and Ipriflavone (isoflavone)
- Orthomolecular Probono - bone health and includes nutrients so that additional MVI is not necessary
- Vitamin Code - Grow Bone System

- Source Naturals - Isoflavones (genistein and daidzein)

○ **MEDICATIONS:** too much thyroid hormone, steroids, anti-seizure drugs, chemo, depo-provera, long term heparin, thiazolidinediones (Avandia), PPIs (ex: Nexium, Prevacid, Prilosec), SSRIs (ex Prozac), thiazide diuretics, aromatase inhibitors (used for breast cancer, ex Femara)

○ **MEDICAL PROBLEMS:** depression, eating disorders (anorexia, bulimia), early menopause (<45), diabetes, poor health, chronic kidney disease, ankylosing spondylitis, autoimmune diseases, cancer, celiac, Crohns, Cushings, cystic fibrosis, chronic liver disease, hyperthyroidism, hyperparathyroidism, MS, Ulcerative colitis, Parkinsons, lactose intolerant, bariatric surgery affects absorption of nutrients

○ **LABS to consider:** (doesn't apply to everyone)

- CBC
- Vit D
- CMP
- calcium, phosphorus
- PTH (if calcium high)
- 24 hour urine for calcium excretion
- TSH
- urine markers for bone loss (NTX)
- celiac disease
- markers for inflammation (hrCRP, sed rate)
- vitamin B12

Maintaining Healthy Bones has life long benefits! ARE YOU WORTH IT? Typically <25% of women will make changes and if changes are made, < 1/2 maintain them. The benefit is lost within 6 mos of stopping changes.

Guidelines for Treatment?

- Treatment with medications is recommended for OP: T score -2.5 on DEXA
- DEXA predicts 40% of the total risk for breaking a bone. If you have low bone mass (osteopenia), another way to estimate your risk of fracture is using **FRAX**. This equation estimates your risk based on several factors:
 - DEXA results
 - age, weight, height
 - parent history of hip fracture
 - personal history of adult fracture
 - personal history of rheumatoid arthritis
 - smoking
 - steroids
 - >3 alcoholic drinks/day
 - Secondary osteoporosis (inflammatory bowel disease, malabsorption, early menopause, chronic liver disease).

FRAX gives a total risk of major osteoporotic fracture and risk of hip fracture in 10 years. This estimate can guide treatment. Meds are recommended if total risk of fracture >20% or if risk of hip fracture >3%.

I hope you find this article helpful, please reach out if you have questions, please send a message through the web portal or call 423-899-9133.

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