

## **Frequently Asked Questions (for Physicians and Other Health Care Providers)**

**When I am speaking to my physician colleagues I am often asked (as a primary care physician who has a special interest in the field of osteoporosis) who I do a work up on, and how I treat low vitamin D levels, etc. The following is the algorithm which I use. These are not intended to be official guidelines of any kind, although they are based on my understanding of the findings presented at the 2005 National Osteoporosis Foundation conference and upon my readings of the scientific literature. Clearly each physician must make their practice and treatment decisions based on his or her own clinical judgment. This document is solely intended to represent my answers to questions and is not intended for any official use and is only to facilitate independent scientific exchange and communication between physicians. – Sharon Hausman-Cohen, MD**

**Question: Who do you do a secondary/ metabolic work up on prior to treating or continuing treatment for osteopenia or osteoporosis?**

**Answer:**

- Anyone with Z score <-1.5
- Anyone with fracture history w/minimal trauma regardless of Z score.
- Anyone losing bone mass >Least Significant Change by DEXA at 2-3 yrs.

**Discussion:**

When a patient has a Z score <-1.5, which means that they have a bone mineral density that is more than 1 ½ standard deviations below normal for their age, they by definition have disproportionate osteoporosis and should have a metabolic evaluation for their osteoporosis.

Anyone with history of a fracture (generally speaking, after age 50 in a low trauma situation such as from standing height or less) regardless of their Z score or T score should have a metabolic evaluation, as a fracture is the best marker of “poor bone quality” we have. One wrist fracture has been shown to increase a woman’s risk of a vertebral fracture 5 fold and a man’s risk 10 fold. Remember, patients with fragility fractures have osteoporosis regardless of their T scores and often have occult vitamin D deficiency or other metabolic problems.

Additionally, bone density machines have an innate level of accuracy called “least significant change”. The percentage change (based on the mineral/area numbers not on the T or Z scores) that is due to machine variability is both operator and machine dependent but tends to be about 2.7% (or higher if switching machines between DEXA scans) for measurements at the spine and about 6% for measurements at the hip. If you get a decline in DEXA readings that are more than this “least significant change” or accuracy level of the machine and the patient is on a bone drug then you should also do a work up for this.

**Question: What work up do you do to evaluate for underlying metabolic causes of, or contributing factors to the osteoporosis?**

**Answer: My basic work up is as below. Sometimes I do additional testing but the following work up will catch the majority of causes, and if you don't find an answer with your basic work up I would recommend referring the patient to a doctor who has a special interest in osteoporosis for further evaluation.**

- **Chem profile** including calcium, albumin, alk phos (note if the calcium is even borderline high or patient has a hx of borderline or high calciums in the chart I would get a PTHi to look for a parathyroid adenoma, alk phos can be elevated in cancers w/ bone mets, multiple myeloma, and poor nutrition w/ low albumin can also trigger bone mineral loss)
- **CBC** (will catch anemia, mastocytosis)
- **TSH**
- **25 OH-vitamin D** (ideal for bone is 35-60 ng/ml).
- **24 hr urine for calcium-sometimes, see below** (low and on calcium think of celiac sprue or absorption problems or low vitamin D, high is hypercalcuria) PTHi (optional); normal is less than 55, but if between 30 and 60 patient may be vitamin D deficient. Very high PTHi (like 100 or more) are usually due to parathyroid adenomas or secondary hyperparathyroidism from renal insufficiency.

**Discussion: The above work up of chem profile, cbc, tsh and 25-OH Vitamin D costs about \$75 at the Medicare billable rate and will catch about 60-70% of the causes of excessive bone loss. In seniors, people with colitis and bowel problems and people who don't exercise outside the most common cause will be low vitamin. Note then when vitamin D levels are very low, urinary calcium may be on low side due to poor absorption secondary to vitamin D, so I sometimes wait before doing urinary calcium levels. In multiple studies over 50% of individuals over age 50 were found to be low on vitamin D even in southern California, and as many as 94% in Minnesota. Recommended daily doses of vitamin D (not when low, just as prevention) have now been increased to 800-1200 IU/day.**

**Question: How do you treat low vitamin D?**

If 25,OH Vitamin D levels are < 30 then give high doses. Vitamin D is fat soluble and can be given weekly.

- Can initially give 50,000 units Vit D2 or D3; 1x/week x 2 months then recheck and maintain patient on 1000 units / day. See discussion of D2 vs D3 below.
- Note; all patients on bone therapies should get 800-1200 units of Vitamin D3 weekly even after levels are brought up to normal or ideal range; (D3 does better job of maintaining levels; both forms are fat stored and can be given weekly)

**Discussion:**

Vitamin D deficiency has become very prevalent in the US, likely due to us spending more time indoors and using sunscreen. You can treat w Vitamin D2 which is a prescription form of vitamin D and comes in 50,000 unit tabs, writing for 1 pill a week x 2 months, but there are numerous studies showing vitamin D3 is better absorbed,

particularly in patients with bowel inflammation from sprue, Crohn's etc. Vitamin D3 is over the counter and is widely available in 1000 unit pills, but also is available in 5000 unit pills. It is often hard to find 5000 unit pills at large chain type pharmacies but there are online pharmacies that sell this as well from reputable sources. We recommend "Pure Encapsulations" brand and keep it in our office (we have no affiliations with them, but they do undergo voluntary standardization inspections/ testing). A physician or pharmacy can order it for from pure encapsulations ([www.purecaps.com](http://www.purecaps.com)) for about \$6 for a bottle of 60 5000 unit D3. The patient price on 60 of the 5000 units pills is about \$11-12.

Why; there have been multiple vitamin D trials at 400 mg of Vit D **did not decrease fracture rates**, but in 5 trials **>800 units Vit D has** (some with calcium, some alone) has shown fracture reduction. The lowest risk of fracture was seen in individuals w/ levelsof 30-60 ng/ml. There has also been increased muscle strength seen with higher vitamin D levels; in NORA timed walk component this correlated to faster walking times. Low vitamin D levels can also cause muscle aches and bone pain (tibia and sternum are best places to palpate for bone pain due to these bone's being close to surface) similar to that seen in fibromyalgia.

#### **How do you treat low or high urinary calcium levels?**

With low levels (<100) (on calcium supplements normal would be 150-250 for women, up to 300 for men). I maximize vitamin D levels, confirm they are taking their calcium and check to make sure they do not have evidence of celiac sprue as this will often cause levels less than 70. Low vitamin D will also lower calcium levels in the urine due to poor absorption of calcium in the absence of vitamin D. With high levels of calcium in the urine (>250 for women, >300 for men) low doses of hydrochlorothiazide can improve renal resorption and thus I generally treat w 12.5 to 25 mg of hctz and then recheck urine tests to make sure this is working; However, first of all make sure that the person doesn't have a parathyroid adenoma as a parathyroid adenoma will also cause elevated urinary calcium (often >400) (check PTHi). Potassium citrate (urocit K) will also improve renal absorption of calcium and can be used to treat over-excretors (or to decrease calcium excretion in someone intolerant to calcium supplements) Note; if someone is taking large amounts of supplements calcium excretion can be falsely elevated so it is reasonable to hold supplements during the day before and while screening for or confirming high urinary calcium excretion. Additionally, a urine calcium/creatinine ratio done on second morning void is a good screening for hypercalcinuria when the patient is not able to do a 24 hr collection. Normal ratios would be .06 to .16.

Note; For patient information on many topics in osteoporosis, such as types of calcium pills, what a z score means, and bone quality, feel free to "borrow" my handouts on my office's website at [www.bwfamilymedicine.com](http://www.bwfamilymedicine.com).