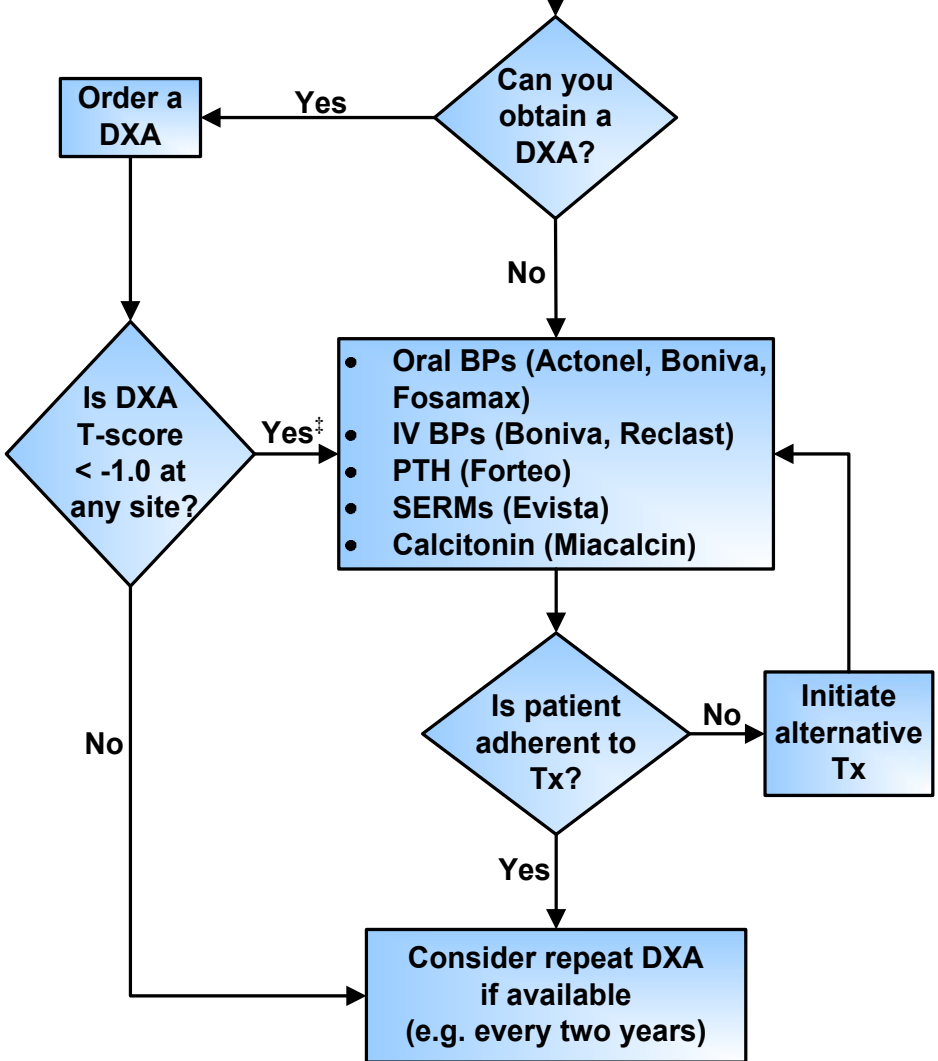


Osteoporosis

Testing and Treatment for Home Health and Long Term Care Patients with a Prior Fracture

- Recommended lab tests:
 - Serum Calcium, Creatinine (calculate GFR^{*}), Alkaline Phosphatase
- Supplemental lab tests:
 - Serum 25 (OH) vitamin D
 - Intact PTH, if calcium is elevated
 - TSH, if on thyroid medication
 - SPEP, if clinical suspicion for myeloma

- Calcium: 500 mg twice daily
- Vitamin D: 50,000 IU of D₂ (ergocalciferol) once a week for 12 weeks^{**}, thereafter 50,000 IU of D₂ (ergocalciferol) once or twice monthly indefinitely
- Fall risk prevention measures[†]
- Weight bearing exercise (e.g. walking)



^{*}Glomerular Filtration Rate (GFR) = $\frac{(140 - \text{age}) \times (\text{weight in kg}) \times (0.85 \text{ for women})}{(\text{creatinine} \times 72)}$

^{**}If serum 25 (OH) vitamin D cannot be measured or is < 30 ng/mL (75 nmol/L)

[†] See other side of card for list of measures (Item #4)

[‡]Assuming no contraindications (e.g. GFR < 30-35 mL/min for BPs, male sex for Evista)

BP – bisphosphonate; DXA – dual energy X-ray absorptiometry; IU – international unit; IV – intravenous; PTH – parathyroid hormone; SERM – selective estrogen receptor modulator; SPEP – serum protein electrophoresis; TSH – thyroid-stimulating hormone; Tx – treatment

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1. Do I need a DXA to start treatment?

No. For many home health or long term care patients, obtaining a DXA is infeasible. In the absence of major trauma (e.g. a motor vehicle accident), if patients over age 50 have had a fracture, they have osteoporosis and can be treated with prescription medication. Medicare recommends that post fracture patients either be screened with a DXA OR treated with a prescription medication within 6 months of fracture.

For patients for whom obtaining a DXA is infeasible, the following table¹ provides the ten-year risk of a major osteoporotic fracture (e.g. hip, clinical vertebral, proximal humerus, distal forearm) among patients with a prior fracture and normal body mass index.

Risk Factors	Caucasian Female		Caucasian Male	
	65	75	65	75
None	26%	46%	16%	24%
Corticosteroids	39%	61%	24%	33%
Currently smoking	27%	48%	16%	24%

2. Why is serum 25-hydroxyvitamin D (OHD) important and what is a healthy level?

- Increases calcium absorption²
 - Decreases fracture risk³
 - Increases muscle strength⁵
- A threshold of ≥ 30 ng/mL (75 nmol/L) is the serum 25(OH)D concentration at which older men and women are at a lower risk of fracture⁶. A desirable range is 30-60 ng/mL. Many "healthy" adults are too low.

3. How much vitamin D should I give?

- If vitamin D cannot be measured or is < 30 ng/mL (75 nmol/L):
 - 50,000 IU of D₂ (ergocalciferol) once a week for 12 weeks, thereafter 50,000 IU of D₂ (ergocalciferol) once or twice monthly indefinitely
- If vitamin D is ≥ 30 ng/mL (75 nmol/L):
 - 50,000 IU of D₂ (ergocalciferol) once or twice monthly indefinitely
- Vitamin D toxicity is rare. Doses as high as 10,000 IU of vitamin D₃ per day for up to 5 months have not resulted in toxicity⁷. Persons spending long amounts of time in the sun (e.g. migrant farm workers, lifeguards) have vitamin D levels in the 150 ng/mL range without any adverse effect⁸.

1. Dawson-Hughes B, Toosteson ANA, Melton III LJ, et al. Implications of absolute fracture risk assessment for osteoporosis practice guidelines in the USA. *Osteo Int* 2008; 19: 449-458
 2. Heaney RP, Dowell MS, Hale CA, Bendich A. Calcium absorption varies within the reference range for serum 25-hydroxyvitamin D. *J Amer Coll Nutr* 2003; 22(2):142-146.
 3. Bischoff-Ferrari HA, Willett WC, Wong JB, et al. Fracture prevention with vitamin D supplementation: a meta-analysis of randomized controlled trials. *JAMA* 2005; 293(18):2257-2264.
 4. Bischoff-Ferrari HA, Dawson-Hughes B, Willett CW et al. Effect of vitamin D on falls: a meta-analysis. *JAMA* 2004;291(16):1999-2006.

4. What fall risk prevention measures should I consider?

1. Home safety evaluation by home health occupational therapist if homebound, or home safety checklist (see www.cdc.gov/nccipc/falls/FallPrev4.pdf for examples)
2. Physical therapy referral for proximal muscle strengthening, balance training and ambulation aids (walker, cane, etc.)
3. When possible, taper off sedatives and psychoactive medications
4. Vision test
5. Alcohol cessation
6. If a patient has symptoms of orthostasis, recommend care on rising quickly from supine/seated position

5. What is the relative risk reduction (RR) for fractures that I can expect with prescription drugs for osteoporosis?

Drug Class	Vertebral Fracture RR (% 95% CI)*	Non-Vertebral Fracture RR (% 95% CI)*	Hip Fracture RR (% 95% CI)*
Bisphosphonates			
• Actonel [®] (risedronate)	39 (24-50)	20 (10-28)	26 (6-41)**
• Boniva [®] (ibandronate)	52 (29-68)	Not significant	Not significant
• Fosamax [®] (alendronate)	45 (31-57)	23 (8-36)**	53 (15-74)
• Reclast [®] (zoledronic acid)	70 (62-76)	25 (13-36)	41 (17-58)
Parathyroid Hormone (PTH)			
• Forteo [®] (teriparatide)	65 (45-78)	35 (2-57)	Not significant
Selective estrogen-receptor modulators (SERMs)			
• Evista [®] (raloxifene)	30 (14-44)	Not significant	Not significant
Calcitonin-salmon			
• Fortical [®] , Miacalcin [®] (calcitonin)	36 (4-57)	Not significant	Not significant

*Data were obtained from product labeling and the Cochrane Collaboration (<http://www.cochrane.org>) and are not from head to head studies. Comparative efficacy is not implied. **Evidence for effect but not an FDA-approved indication.

5. Bischoff HA, Studelin, HB, Dick W, et al. Effects of vitamin D and calcium supplementation on falls: a randomized controlled trial. *J Bone Miner Res* 2003; 18(2):343-351.
 6. Dawson-Hughes B, Heaney RP, Holick MF, et al. Estimates of optimal vitamin D status. *Osteoporosis Int* 2005; 16(7):713-716.
 7. Vithell K. Why the optimal requirement for vitamin D is probably much higher than what is officially recommended for adults. *J Steroid Biochem Mol Biol* 2004; 89:90-97-99
 8. Vithell K. Vitamin D supplementation, 25-hydroxyvitamin D concentrations, and safety. *Am J Clin Nutr* 1997; 69:842-856