

## **Bone Loss (Osteopenia and Osteoporosis)**

### **WHO guidelines:**

T score is a comparison of a person's bone density at current time compared to the person's bone density when the person was around 25 to 30 years old. Peak bone density is between the ages of 25 and 30.

T score from 0 to -1.0 (and including -1.0) is normal

T score from -1.1 to -2.4 is osteopenia

T score of -2.5 or less (more negative) is osteoporosis

DXA (dual energy X-ray absorptiometry) is the preferred way to check bone density.

### **Indications for measuring bone density:**

1. Women over age 65, Men over age 70
2. Women and men under age 65 with hyperparathyroidism, hyperthyroidism, hypogonadism, Cushing's syndrome, long-term use of glucocorticoid therapy, have lost height of more than 2 cm, vitamin D deficiency, tobacco use, excess alcohol use, immobilization, use of antiepileptic drugs, family history of osteoporosis, or have a fragility fracture.

### **Laboratory Evaluation:**

1. Serum chemistry panel to include calcium, phosphorous, albumin, magnesium, alkaline phosphatase, creatinine
2. Serum parathyroid hormone
3. Thyroid function tests
4. 25 hydroxy Vitamin D (calcidiol)
5. CBC
6. Testosterone panel in men
7. 24 hour urine collection for calcium and creatinine
8. Consider 24 hour urine collection for cortisol and creatinine if patient has symptoms/signs of Cushing's syndrome
9. Consider SPEP/UPEP to r/o multiple myeloma
10. Consider 24 hour urine NTx (telopeptide crosslinks) or serum CTX (-markers of bone resorption)
11. Consider evaluation for Celiac disease

## **Treatment:**

1. **Calcium**- (see separate handout for patients) 1000mg to 1500mg in divided doses per day along with 800 IU to 2000 IU of vitamin D per day, replete 25 hydroxy Vitamin D levels to  $\geq 30$  ng/ml
2. **Weight bearing exercise**
3. Oral Bisphosphonates:
  - a. Alendronate \*(Fosamax®)- prevention and treatment of osteoporosis and prevention and treatment of corticosteroid-induced osteoporosis , 5mg daily or 35mg weekly for prevention and 10mg daily or 70mg weekly for treatment, always ingested on an empty stomach, full 8 oz water, no eating or drinking for at least 30 min, remain upright for at least one hour after ingestion, patient must continue daily use of calcium and vitamin D, contraindicated in severe renal disease (creatinine clearance less than 30ml/min), contraindicated in patients with abnormalities of the esophagus which delay esophageal emptying such as stricture or achalasia
  - b. Risedronate\* (Actonel®)-prevention and treatment of osteoporosis and prevention and treatment of corticosteroid-induced osteoporosis, 5mg daily and/or 35mg weekly for all indications, always ingested on an empty stomach, full 8 oz of water, no eating or drinking for at least 30min, remain upright for at least one hour after ingestion, patient must continue daily use of calcium and vitamin D, contraindicated in severe renal disease (creatinine clearance less than 30ml/min), contraindicated in patients with abnormalities of the esophagus which delay esophageal emptying such as stricture or achalasia
  - c. Ibandronate\* (Boniva®)-prevention and treatment of osteoporosis- 2.5mg daily or 150mg monthly, always ingested on an empty stomach, full 8 oz of water, no eating or drinking for at least 60 min, remain upright for at least one hour after ingestion, patient must continue daily use of calcium and vitamin D, contraindicated in severe renal disease (creatinine clearance less than 30ml/min), contraindicated in patients with abnormalities of the esophagus which delay esophageal emptying such as stricture or achalasia
4. IV Bisphosphonates:
  - a. Ibandronate\* (Bonvia®)-3mg IV push every 3 months, contraindicated if serum creatinine is  $>2.3$  or creatinine clearance is  $<30$ ml/min., patient must continue daily use of calcium and vitamin D
  - b. Zoledronic Acid\* (Reclast®)- 5mg per 100ml, for use in osteoporosis as an infusion given once per year. The 100ml solution is given IV via a vented infusion line over 20 minutes at a constant infusion rate. Reclast® is

contraindicated in patients with hypocalcemia and in patients with creatinine clearance less than 35mL/min.

5. Teriparatide\* (Forteo®)- 20micrograms/day subcutaneous injection, for use in severe osteoporosis and/or osteoporosis with fractures, must be refrigerated, patient must continue daily use of calcium and vitamin D, not approved for concomitant use with bisphosphonates
6. Calcitonin\* (Miacalcin®) nasal spray- FDA approved for osteoporosis treatment, much weaker than bisphosphonates, can be used synergistically with bisphosphonates, 200 IU (one spray) intranasally daily, can cause rhinitis or epistaxis, helps with pain from compression fractures, patient must continue daily use of calcium and vitamin D
7. Denosumab\* (Prolia®) SQ injection-FDA approved for postmenopausal women with osteoporosis at a high risk of fracture (history of osteoporotic fracture, multiple risk factors for fracture) or patients who have failed or are intolerant of other osteoporosis medications. 60mg SQ daily for 6 months. Should not be given if patient is hypocalcemic or vitamin D deficient.

Repeat bone mineral density every 24 months while patients are receiving treatment.

\* For all medications, please consult Up-To-Date, a PDR, or other comprehensive drug reference for interactions and full list of indications and contraindications. Check hospital formulary status and use formulary drugs whenever possible and as indicated.