**Osteoporosis Screening, Work-up and Management**

**Resource:**

Up-To-Date; [www.uptodate.com](http://www.uptodate.com)

American Association of Clinical Endocrinologists (AACE); [www.aace.org](http://www.aace.org)

1. **Background**

More than 10 million American have osteoporosis and more than 34 million with low bone mass. 80% are women and most are postmenopausal. At age 60, 50% of white women have either osteopenia or osteoporosis.

Menopause-related bone loss begins 3-5 years before the last menstrual period and continues for 3-5 years afterward at a rate of 1% to 2% per year.

1. **At Risk for Osteoporosis**

|  |  |
| --- | --- |
| **Primary Osteoporosis** | **Secondary Osteoporosis** |
| Postmenopausal women | Hypogonadism |
| High risk population | Premature menopause |
| * Previous fracture | Diabetes |
| * Long-term glucocorticoid therapy | Malabsorption |
| * Low body weight (BMI < 20kg/m2) | Chronic liver disease |
| * Family history of hip fracture | Inflammatory bowel disease |
| * Cigarette smoking | Hyperparathyroidism |
| * Excessive alcohol intake (3+ daily) | Drugs |
| * Rheumatoid Arthritis | * Warfarin |
| * Early menopause | * Lithium |
|  | * Antiepileptic |
|  | AIDS/HIV |
|  | COPD |
|  | Renal Insufficiency/ Failure |
|  | Thalassemia |

1. **Work-up**
2. Medical history and physical exam
   1. Assess risk factors
   2. Exam for height loss or kyphosis
   3. Assess risk of falling
   4. Laboratory (suspicious for secondary causes): CBC, CMP, iPTH, Vitamin D, TSH, free T4, Alkaline Phosphatase, 24 hour urine calcium/creatinine, and SPEP
3. DEXA scan to be considered for the following population
   1. Willing to take pharmacological treatment if found low
   2. All women 65 years or older
   3. Younger postmenopausal women
      1. With history of fractures without trauma
      2. Starting or taking long-term glucocorticoid therapy (>3 months)
      3. With documented osteopenia
      4. High risk patients (see above)
4. **Definition**

WHO Criteria for Osteopenia and Osteoporosis

|  |  |
| --- | --- |
| **Category** | **T-score** |
| Normal | -1.0 or above |
| Osteopenia | Between -1.0 to -2.5 |
| Osteoporosis | -2.5 or below |

1. **Fall Risk Assessment**

**FRAX Score**

* Estimate the 10-year probability of hip fracture or major osteoporotic fractures for an untreated patient using femoral neck BMD
* Use country specific fracture and mortality data
* Recommend **drug therapy when 10-year probability** of major osteoporotic fracture **exceeds 20%**
* Website: [www.shef.ac.uk/FRAX](http://www.shef.ac.uk/FRAX)



1. **Management**
2. Lifestyle changes
   1. Recommended Calcium with 700-800 IU/d Vitamin D

|  |  |  |
| --- | --- | --- |
| **Age** | **Sex** | **Daily Allowance (mg/d)** |
| 19-50 years | M,F | 1,000 |
| 51-70 years | M | 1,000 |
| 51-70 years | F | 1,200 |
| 71+ years | M,F | 1,200 |

* 1. Regular weight-bearing exercises
     1. 30-40 minutes of walking
     2. Back and posture exercises
     3. Strength training
  2. Avoid use of cigarettes
  3. Limit alcohol consumption
  4. Fall preventions
     1. Anchor rugs
     2. Minimize clutter
     3. Remove loose wires
     4. Install handrails

1. Pharmaceutical
   1. Recommended for post-menopausal women
   2. NOT recommended for premenopausal women with low bone mass only without fractures or secondary causes
   3. Need to take cost and adherence into consideration
   4. First line therapy
      1. Alendronate (Fosamax)
      2. Risedronate (Actonel)
      3. Zoledronic acid (Reclast)
      4. Denosumab (Prolia)
   5. Second line therapy
      1. Ibandronate (Boniva)
      2. Raloxifene (Evista)
   6. Third line therapy
      1. Raloxifene (Evista)
      2. Calcitonin (Miacalcin, Fortical)
   7. Teriparatide (Forteo) recommended for patients with very high fracture risk or in which bisphosphonate therapy has been ineffective- NOT recommended for patients with risk for osteosarcoma
   8. See Table 1 for dosing recommendations

Table 1: Dosing Recommendations

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | **Postmenopausal**  **osteoporosis** | **Glucocorticoid-induced**  **osteoporosis** | **Risk Reduction** | | **Cost\***  **per year** |
| **First Line Drug** | **Treatment** | **Treatment** | **Vertebral** | **Hip** |  |
| Alendronate# (Fosamax) in liquid and tablet forms | 10 mg PO daily or  70 mg PO weekly or  70 mg+Vit D PO weekly | 5 mg PO daily or  10 mg PO daily | Yes | Yes | $500-$800 |
| Risedronate  (Actonel, Atelvia) | 5 mg PO daily or  35 mg PO weekly or  150 mg PO monthly or | 5 mg PO daily | Yes | Yes | $2,400 |
| Zoledronic acid (Reclast) | 5 mg IV yearly | 5 mg IV yearly | Yes | Yes | $1,000 |
| Denosumab (Prolia) | 60 mg SQ every 6 months |  | Yes | Yes | $2,000 |
| **Second Line Drug** | **Treatment** | **Treatment** | **Vertebral** | **Hip** |  |
| Ibandronate (Boniva) | 150 mg PO monthly or  3 mg IV every 3 months |  | Yes | No effect demonstrated | $1,600  $2,200 |
| Raloxifene (Evista) | 60 mg PO daily |  | Yes | No effect demonstrated | $2,800 |
| **Third Line Drug** | **Treatment** | **Treatment** | **Vertebral** | **Hip** |  |
| Raloxifene (Evista) | 60 mg PO daily |  | Yes | No effect demonstrated | $2,800 |
| Calcitonin (Miacalcin, Fortical) | 200 IU intranasal qd or  100 IU SQ qod |  | Yes | No effect demonstrated | $1,200  $3,700 |
| **Last Choice Drug** | **Treatment** | **Treatment** | **Vertebral** | **Hip** |  |
| Teriparatide (Forteo) | 20 mcg SQ daily | 20 mcg SQ daily | Yes | No effect demonstrated | $15,000 |

\* Cost based on average wholesale price from Redbook, 2014

# Drug cost could be less expensive through larger chain stores i.e. Target, Walmart, Costco, etc.

1. Follow-up
   1. Repeat DEXA scan

|  |  |
| --- | --- |
| **T-score** | **Frequency** |
| -2.00 to -2.49 | Every 2 years |
| -1.50 to -1.99 | Every 3-5 years |
| -1.01 to -1.49 | Every 10-15 years |

* 1. Changing Pharmaceuticals
     1. DO NOT assume that patient is not responding to medication. Poor adherence to drug regimen is common for poor response to medication
     2. GI complaints are the most common for bisphosphonates. Recommendation is to discontinue until the symptoms are resolved and to rechallenge with the same or different bisphosphonate.
  2. Drug Holiday
     1. No consensus on how long to continue bisphosphonate
     2. Stop therapy after 3-5 years of therapy is reasonable for some women
        1. Stable BMD
        2. No previous vertebral fractures
        3. Low risk for fracture
     3. Alendronate or risedronate after 5 years
     4. Zoledronic acid after 3 years
     5. Restart of bisphosphonates
        1. 5% bone loss on 2 DEXA scans 2 years apart