Osteoporosis Fracture Prevention Guideline
September 2011

Rationale for Guideline
This is a consensus-based guideline. Although many studies have been published about osteoporosis treatment in postmenopausal women, only 1 trial in early postmenopausal women has evaluated the effectiveness of osteoporosis screening on fracture outcome (Barr RJ Osteoporos Int (2010) 21:561–568). Therefore, direct evidence that screening improves outcomes is limited. Recommendation for screening is based on the following three points: 1) The risk of osteoporosis increases with advancing age particularly for postmenopausal women 2) Accurate screening tests for osteoporosis exist and decreased BMD does strongly predict fracture risk 3) High quality trials have demonstrated the efficacy of bisphosphonates in preventing hip fractures and selective estrogen-receptor modulator medications in preventing vertebral fractures in women with osteoporosis. The average mortality rate in the first year following a hip fracture is approximately 25% and ~25% of previously ambulatory hip fracture survivors require subsequent long-term care. Despite this impact on premature morbidity and mortality and recommendations by many organizations including the USPSTF, assessment of fracture risk and screening for osteoporosis is not routine.

Definition
Osteoporosis is defined as a skeletal disorder characterized by compromised bone strength predisposing to an increased risk of fracture. Bone strength reflects both bone density and bone quality.

Target Population
Women over age 65 years and women age 50 and over with risk factors for osteoporosis. Men over age 70 with risk factors or men age 50 and over at high risk due to other conditions (e.g., chronic glucocorticoid use).

Source of Evidence
See National Osteoporosis Guideline Nov 2008 for problem formulations, evidence discussion and evidence tables. This guideline has been modified to align with formulary and operational issues in KPCO. See also


Settings for Application
Internal Medicine, Family Practice, Ob/Gyn, Radiology, Endocrinology, Nephrology, Rheumatology and other specialties as appropriate
**Methods for Measuring Compliance**

Osteoporosis Screening HEDIS rates, hip fracture rates and cost, number of average women over age 65 screened or treated, medication compliance.

**1. Screening Bone Mineral Density (Average Risk)**

**RECOMMENDATIONS:**

### Postmenopausal women:

**1A.** A bone mineral density (BMD) test by dual energy x-ray absorptiometry (DXA) is recommended for postmenopausal women age 65 and older who are not on drug treatment for osteoporosis. (Evidence based: B)

Please note that those with clinically diagnosed osteoporosis (i.e., prior fragility fracture of the hip or spine) and those at very high risk of fracture (i.e., oral glucocorticoid users and other secondary causes of low BMD) are excluded from this problem formulation.

**1B.** A bone mineral density (BMD) test by dual energy x-ray absorptiometry (DXA) is recommended for postmenopausal women under the age of 65 whose fracture risk is equal to that of a 65 year-old white woman with no additional risk factors (i.e., 10-yr hip fracture risk of 1.2% or a 10-yr major osteoporotic fracture risk of 9.3%). This risk can be assessed by calculating a FRAX score prior to obtaining a BMD (http://www.sheffield.ac.uk/FRAX/index.jsp).

(Consensus based)

Risk Factors for osteoporosis include:

Evidence-based: A

- Fragility fracture after age 50
- History of frequent falling in the past year
- Smoking
- Weight <127 lbs, or BMI <21
- 1st degree relative with hip fracture

Consensus-based:

- 15 years of menopause or estrogen deficiency for women

Note that 60% of fracture risk can be accounted for by bone density and the remaining 40% is due to other factors (i.e., bone strength).

### Men:

**1C.** Screening is an option for men over age 70 with risk factors. (Consensus based)

**Optimal screening frequency:**

**1D.** Because evidence is lacking, consensus based recommendations for repeating a screening DXA scan vary widely - from no recommendation to intervals as long as 10 years. Thus, consider a 5 year retesting interval in untreated persons at high risk for
2. Testing for Women and Men at Very High Risk of Fracture

RECOMMENDATIONS:

Women and Men with prior fragility fracture* after the age of 50:

2A. For women and men with a fragility fracture of the hip or spine (i.e., clinical osteoporosis) after the age of 50: Initiating treatment directly without undergoing testing with BMD is recommended. (Consensus based)

For women and men with other fragility fractures (e.g., wrist or humerus) after the age of 50: Initiating treatment directly without undergoing testing with BMD is an option. (Consensus based)

*A fragility fracture is a low-trauma fracture resulting from a fall from standing height or less.

Women and Men on oral glucocorticoid therapy*:

2B. For women and men on oral glucocorticoid therapy: Initiating treatment with bisphosphonates directly without undergoing testing with BMD is an option (Evidence based: B)

*>5 mg/day prednisone or equivalent for >3 months duration

3. Bone Mineral Density Screening Measurement Sites

RECOMMENDATIONS:

3A. The hip and lumbar spine are recommended measurement sites for BMD to predict risk of osteoporotic fracture in women and men. (Evidence-based: B)

3B. BMD of the forearm is an option for patients in whom hip and spine BMD cannot be measured or interpreted. (Evidence-based: B)

4. Lifestyle Changes

RECOMMENDATIONS:

4A. The following lifestyle changes are recommended for all women and men to reduce the risk of osteoporosis:

▪ Exercise – regular weight-bearing and muscle-building exercise
▪ Smoking cessation

(Consensus-based)

4B. Home safety proofing is recommended for postmenopausal women and men at risk of falling.* (Consensus-based)
4C. The routine use of hip protectors is not recommended as an intervention for reducing the risk of hip fractures in postmenopausal women and men aged 50 and older. (Evidence-based D) – NOTE: WITH THE RECENT SCANDAL REGARDING THE NEGATIVE HIP PROTECTOR TRIAL, THIS REC MAY NOT HOLD: http://www.hhs.gov/ohrp/detrm_letrs/YR11/june11a.pdf

*Home safety proofing includes removing rugs, adding grab bars, establishing adequate lighting (i.e. nightlights), and securing electrical cord placement.

Preventive measures for women or men with and without osteoporosis

5A. Total daily intake of calcium is recommended for all pre- or post-menopausal women and older men (1,000 mg/day for premenopausal women; 1,200 mg/day for postmenopausal women and men over age 50). (Consensus-based)

5B. Total daily intake of at least 1000 IU/day vitamin D is recommended for all pre- or postmenopausal women and men over age 50. (Evidence based: B)

Preventive measures for women and men without osteoporosis

5C. Hormone therapy solely for the prevention of osteoporosis is not recommended. (Consensus-based)

Preventive measures for postmenopausal women diagnosed with osteoporosis by:

- Postmenopausal women with a prior fragility fracture. *(Evidence–based: A)*

- Women aged 65 or older with a diagnosis of osteoporosis (T-score ≤ −2.5). *(Evidence–based: A)*

  - Osteopenia with 10 year risk of hip fracture ≥3% or a 10 year major osteoporotic fx risk ≥20% per FRAX calculation

First-line drug therapies

Note: Test for Vitamin D deficiency (25-OH Vitamin D level) when therapy is initiated.

5D. Bisphosphonates.

  **Current preferred formulary agent:** Alendronate 70 mg once weekly

  If alendronate is NOT tolerated, risedronate (Actonel) 35 mg weekly is an option (requires NF review per medical necessity)

  NOTE: Bisphosphonates should be used in caution with chronic kidney disease and reduced GFR and consider decreasing dose of oral bisphosphonates to every other week if CrCl < 30 ml/min

  Zoledronic acid (Reclast) IV can be considered for pts with contraindications or intolerances to two oral bisphosphonates

Second-line drug therapies

(The following medications are for use only when bisphosphonates are contraindicated or not tolerated in postmenopausal women. It is recommended treatment be discussed with endocrinology before ordering any of the below agents).

5E. Raloxifene is an option for postmenopausal women with prior vertebral fracture and low risk for thrombotic complications. Evidence has NOT demonstrated a statistically significant decrease in the incidence of hip fractures with this agent. *(Evidence based: B)*

5F. Calcitonin is an option for postmenopausal women over the age of 65 with a prior vertebral fracture or T-score at or below -2.5. Evidence has NOT demonstrated a
statistically significant decrease in the incidence of hip fractures with this agent. (Evidence based: B)
5G. Teriparatide (Forteo): Part D formulary only (non-formulary review required for commercial members).
5H. Denosumab (Prolia): Non-formulary agent (requires NF review per medical necessity).

**Preventive measures for premenopausal women with a T-score at or below -2.5**
5H. There is insufficient evidence to recommend for or against treatment with any prescribed pharmacological therapy for premenopausal women.* (Evidence based: I)
* Bisphosphonates are not recommended in women of childbearing age without adequate contraception.

**Preventive measures for women and men taking corticosteroid therapy**
5I. Bisphosphonates: Alendronate 70 mg once weekly is recommended as first-line therapy for women and men taking oral corticosteroid medication (>5 mg/day prednisone or equivalent, for >3 months duration). If alendronate is not tolerated, consider risedronate (Actonel) 35 mg once weekly (Non-Formulary).
*† (Evidence based: B)
* Bisphosphonates are not recommended in women of childbearing age without adequate contraception.
† Bisphosphonates should be used with caution in patients with chronic kidney disease and reduced GFR.

**Treatment Durations**
5J. There is insufficient evidence on optimal treatment durations for the pharmacologic management of osteoporosis. (Evidence based: I)

**6. Monitoring Treatment**

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<th>RECOMMENDATIONS:</th>
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<td><strong>6A.</strong> Routine BMD testing is not recommended for monitoring the rate of bone loss after initiation of treatment in women or men. (Consensus based)</td>
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<td><strong>6B.</strong> There is insufficient evidence on routine bone turnover testing with biochemical markers [N-telopeptide (NTx) and C-telopeptide (CTx)] for monitoring women and men taking antiresorptive therapy for osteoporosis. (Evidence based: I)</td>
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<td><strong>6C.</strong> There is insufficient evidence for routine bone turnover testing with biochemical markers [N-telopeptide (NTx) or C-telopeptide (CTx)] to assess a patient’s risk for developing osteonecrosis of the jaw (ONJ) while on bisphosphonate therapy. (Consensus-based)</td>
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**7. Evaluation of secondary causes**

| 7A. History and physical are critical in evaluation of secondary causes |
| 7B. The following lab tests may also be considered (consensus based): |
| - CBC |
| - Comprehensive metabolic profile |
| - TSH with reflex T4 |
| - PTH panel |
| - 25 hydroxy Vit D level |
For males- testosterone level  
Consider 24 hr urine calcium

*For all patients with secondary causes, consider endocrinology/other appropriate consult using "p advice endo".*

### 8. Supplemental Information on Secondary Causes of Bone Loss

Data from The North American Menopause Society, Position Statement 2010 (Menopause: The Journal of The North American Menopause Society Vol. 17, No. 1, pp. 25/54) (note that these are not listed in order of frequency or clinical importance)

#### Medications

- Oral or intramuscular use of glucocorticoids for > 3 months
- Aromatase inhibitors: anastrozole (Arimidex), letrozole (Femara), exemestane (Aromasin)
- Long-term use of certain anticonvulsants (carbamazepine, phenobarbital, phenytoin, primidone, valproic acid)
- Heparin
- Cytotoxic agents
- Gonadotropin-releasing hormone agonists or analogues
- Intramuscular medroxyprogesterone contraceptive
- Immunosuppressives (eg, cyclosporine, tacrolimus)
- Excessive thyroxine doses

#### Genetic Disorders

- Osteogenesis imperfecta
- Thalassemia
- Hypophosphatasia
- Hemochromatosis

#### Disorders of calcium balance

- Hypercalciuria
- Vitamin D deficiency

#### Endocrinopathies

- Cortisol excess
- Cushing’s syndrome
- Gonadal insufficiency (primary and secondary)
- Hyperthyroidism
- Type 1 diabetes mellitus
- Primary hyperparathyroidism

#### Gastrointestinal disease

- Chronic liver disease (eg, primary biliary cirrhosis)
- Malabsorption syndromes (eg, celiac disease, Crohn's disease)
- Total gastrectomy
- Billroth I gastroenterostomy

Other disorders and conditions

- Multiple myeloma
- Lymphoma and leukemia
- Systemic mastocytosis
- Nutritional disorders (eg, anorexia nervosa)
- Rheumatoid arthritis
- Chronic renal disease

For all patients with secondary causes, consider endocrinology/other appropriate consult using "p advice endo".

These procedures are informational only and are not intended or designed to substitute the reasonable exercise of independent clinical judgment by the practitioner in any particular set of circumstances for each patient encounter. The guidelines are flexible and are intended for use as a resource for integration with a sound exercise of clinical judgment. They can be used to create an approach to care that is unique to the needs of each individual patient.