

OSTEOPOROSIS

AGS Geriatric Evaluation and Management Tools (Geriatrics E&M Tools) support clinicians and systems that are caring for older adults with common geriatric conditions.

From the AMERICAN GERIATRICS SOCIETY

Geriatrics Evaluation & Management Tools

DEFINITIONS

- Established osteoporosis: fracture due to minimal trauma of any bone
- A skeletal disorder characterized by compromised bone strength predisposing to an increased risk of fracture

SCREENING

- All women ≥ 65 years old should be offered bone mineral density (BMD) screening with a dual-energy radiographic absorptiometry (DXA) scan
- Women ages 60–64 years old should have BMD screening with DXA if they are:
 - Postmenopausal with multiple risk factors (ie, early menopause, white or Asian race, low body weight, no current use of estrogen therapy, sedentary, smoker, alcohol abuse, primary hyperparathyroidism, hyperthyroidism, or glucocorticoid use)
 - Postmenopausal and present with fractures
- All men >70 years old (National Osteoporosis Foundation)
- Men <70 years old should have a screening DXA scan if any of the following risk factors is present:
 - >3 months of systemic glucocorticoid treatment
 - Primary hyperparathyroidism
 - Osteoporosis in a first-degree relative
 - Hypogonadism
 - Use of gonadotropin-releasing hormone antagonist
- Osteopenia on X-ray
- FRAX tool calculates the 10-year probability of major osteoporotic fracture or hip fracture (www.shef.ac.uk/FRAX/tool.jsp?locationValue=2)

PAST MEDICAL HX

Risk of osteoporosis increases with history of smoking, alcohol abuse, primary hyperparathyroidism, hyperthyroidism, renal failure, early menopause, dementia, depression, low calcium intake

FAMILY HX

Positive family history of osteoporosis; osteoporotic fracture in a first-degree relative

SOCIAL HX

- Tobacco use
- Alcohol abuse
- Exercise

MEDICATIONS

Medications that may increase the risk of osteoporosis include: anticonvulsants, cyclosporine, glucocorticoids, long-term heparin, methotrexate, thyroid hormone replacement, lithium, selective serotonin reuptake inhibitors, proton pump inhibitors

PHYSICAL EXAM

- Comprehensive physical exam with focus on musculoskeletal exam:
- BMI <20
 - Gait and balance
 - Strength
 - Kyphosis

LABS & IMAGING

- All patients newly diagnosed with osteoporosis:
 - Complete blood count
 - Thyroid-stimulating hormone
 - Complete metabolic profile, including liver function tests
 - Calcium
 - Vitamin D
 - Phosphorus
 - Bioavailable testosterone (men only)
- Consider need to rule out secondary causes of osteoporosis:
 - 24-hour urinary cortisol
 - Thyroxine level
 - Serum and urine protein electrophoresis
 - Parathyroid hormone levels

MANAGEMENT STRATEGIES

- All patients with risk factors or diagnosis of osteopenia/osteoporosis should be counseled about:
 - Calcium intake: 1200–1500 mg/day
 - Vitamin D₃ intake: 400–800 IU/day (if Vitamin D level within normal limits)
 - Weight-bearing exercises (walking, jogging, jump rope); resistance training; and balance training (if indicated)
 - Fall prevention
- A female patient with osteoporosis should also be treated with:
 - Bisphosphonates or raloxifene or calcitonin or hormone replacement therapy (Note: increases risk of breast cancer, heart disease, stroke, and venous thromboembolism); or parathyroid hormone (teriparatide)
- A male patient with osteoporosis should be treated with:
 - Bisphosphonates or calcitonin or parathyroid hormone or testosterone (if hypogonadal and no history of prostate cancer)
- Osteoporosis prophylaxis for patients using corticosteroids is indicated if taking ≥ 7.5 mg/day of prednisone (or equivalent) for:
 - ≥ 1 month—Prescribe calcium/Vitamin D supplements
 - ≥ 3 months—Prescribe bisphosphonate therapy

PHARMA- COLOGICAL MANAGEMENT

Medication	Dosage	Formulations	Comments
Bisphosphonates			<i>Class effect:</i> Esophagitis; bone, joint, or muscle pain; osteonecrosis of jaw (estimated 0.01%–0.0001% with oral therapy) ^b ; occipital inflammation; possibly serious atrial fibrillation ($\leq 1.5\%$); association with atypical femoral fractures rare ($< 6/10,000$ patient-years). Consider discontinuing after 5 years
Alendronate (Fosamax)	Prevention: 5 mg/d or 35 mg/wk Treatment: 10 mg/d or 70 mg/wk	T: 5, 10, 35, 40, 70; 70 sol	Must be taken fasting with water; patient must remain upright and npo for ≥ 30 min after taking; do not use if CrCl < 35 mL/min; relatively contraindicated in GERD
Ibandronate (Boniva)	Treatment and prevention: po: 150 mg/mo or 2.5 mg/d; IV: 3 mg q3mo	T: 2.5, 150 IV: 1 mg/mL (available in 3-mL prefilled syringes)	Must be taken fasting with water; patient must remain upright and npo for ≥ 60 min after taking; do not use if CrCl < 30 mL/min
Risedronate (Actonel)	Treatment and prevention: 35 mg/wk, 5 mg/d, or 150 mg/mo	T: 5, 30, 35, 150	Must be taken fasting or ≥ 2 h after evening meal; patient must remain upright and npo for 30 min after taking; do not use if CrCl < 30 mL/min
Zoledronic acid (Reclast)	5 mg IV given over > 15 min every year for treatment or every 2 years for prevention	5 mg/100 mL	Not recommended if CrCl < 35 mL/min; may cause acute renal failure in patients using diuretics
Others			
Raloxifene (Evista)	60 mg/d	T: 60	Used more often for prevention because of reduced risk of breast cancer; may cause hot flashes
Calcitonin (Calcimar, Cibacalcin, Miacalcin, Osteocalcin, Salmonine)	Treatment and prevention: 100 IU/d SC (human) or 200 IU intranasally (salmon) in alternate nostrils q48h	Inj: human (Cibacalcin) 0.5 mg/vial Intranasal: salmon 200 units/mL (Miacalcin)	May also be helpful for analgesic effect in patients with acute vertebral fracture; rhinitis in 10%–12%
Estrogen			For use in select patients
Teriparatide (Forteo)	Treatment: 20 mcg/d for up to 24 mo	Inj 3 mL, 28-dose disposable pen device	Contraindicated in patients with Paget disease or prior skeletal radiation therapy; treatment for 1 year followed by 1 year of bisphosphonates can maintain 1-year gains in BMD
Denosumab (Prolia)	60 mg SC q6mo	Inj: 60 mg/mL in pre-filled syringe	Skin infections, dermatitis, osteonecrosis of jaw, hypocalcemia especially if CrCl < 30 mL/min and uncorrected calcium

^aUnless specified, medication can be used for prevention or treatment.

^bRisk factors include IV treatment (little data on osteoporosis doses); cancer; dental extractions, implants, and poor-fitting dentures; glucocorticoids; smoking; and preexisting dental disease. Some experts recommend that bisphosphonates be stopped for several months before and after elective complex oral procedures (or, if procedures are emergent, that bisphosphonates be held for several months after).

SOURCE: Reuben DB, Herr KA, Pacala JT, et al. *Geriatrics At Your Fingertips*, 14th ed. New York, NY: American Geriatrics Society; 2012. Reprinted with permission.

FOLLOW-UP

No consensus data for monitoring therapy