### CARE GUIDE for Osteoporosis

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| Evaluate for Osteoporosis and Fracture Risk Reduction (1,2,8,20,22) | • Counsel all patients, both men and women, age ≥ 50 years on risk of osteoporosis and measures to decrease risk of fractures  
  • Assess lifestyle factors (22)  
  ➢ Alcohol abuse - more than two drinks per day for women or three drinks a day for men may be detrimental to bone health, increases the risk of falling  
  ➢ Frequent falling  
  ➢ Inadequate physical activity  
  ➢ Vitamin D insufficiency  
  ➢ Low calcium intake  
  ➢ High salt intake  
  ➢ Excessive thinness  
  ➢ Excess vitamin A  
  ➢ Immobilization  
  ➢ Smoking (active or passive)  
  ➢ Increased likelihood of falling | • Lifestyle, conditions, diseases, and medications can cause or contribute to osteoporosis and fractures | • Advise individuals regarding a diet that includes adequate amounts of total calcium intake (diet and supplements) (22)  
  ➢ Women ≤ 50 years of age and men ≤ 70 years should have 1,000 mg of calcium per day (23)**  
  ➢ Women ≥51 years of age and men ≥71 years of age should have 1,200 mg of calcium per day (1)*,**  
  ➢ 1,500 mg of calcium daily may be needed in people with established osteoporosis, on glucocorticoid therapy, or in persons over the age of 65 years (1)  
  ➢ Intakes in excess of 1200 to 1500 mg/day may increase the risk of developing kidney stones and other conditions. Individuals should check with their healthcare providers (22)  
  • Advise individuals on vitamin D intake, including supplements if necessary for individuals age 50 and older  
  ➢ Vitamin D (800-1,000 International Units (IU)) for individuals ≥ 50 years (1)*  
  ➢ Vitamin D (400-800 IU daily) for individuals under age 50 (23)  
  ➢ Some individuals needs more Vitamin D. The Institute of Medicine states that the safe upper limit of Vitamin is 4,000 IU per day for most adults (23) | • Repeat counseling on osteoporosis risk reduction at preventive care visits  
  • Assess patient’s self-management of lifestyle factors at each visit  
  ➢ Refer to health coaches if necessary/appropriate |
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| • Perform biochemical testing in patients with specific secondary treatable causes The World Health Organization (WHO) fracture risk assessment tool: [http://www.shef.ac.uk/FRAX/](http://www.shef.ac.uk/FRAX/) | | ✓ Regular weight-bearing and muscle-strengthening exercise  
✓ Flexibility exercises  
✓ Stability and balance exercises,  
✓ Avoid high-impact exercise and bending and twisting exercises\  
✓ Counsel on tobacco cessation  
✓ Counsel on excessive alcohol intake  
✓ Fall reduction strategies – personal and environmental | | |

* The USPSTF concludes that the current evidence is insufficient to assess the balance of the benefits and harms of daily supplementation with greater than 400 IU of vitamin D and greater than 1,000 mg of calcium for the primary prevention of fractures in noninstitutionalized postmenopausal women. It recommends against daily supplementation with 1000 mg or less of calcium and 400 IU or less of vitamin D for the primary prevention of fractures in non-institutionalized, postmenopausal women. Consider: Other secondary causes of osteoporosis (see below)  

** This includes the total amount of calcium you get from food and supplements  

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| Bone Mineral Density (BMD) Testing | • BMD testing for:  
  ➢ Women ≥ 65 years  
  ➢ Men ≥ 70 years  
  ➢ Younger postmenopausal women and men aged 50-69 years, based on risk factor profile*  
  ➢ Peri-menopausal women with a specific risk factor (e.g., low body weight, high risk medication)  
  ➢ Recommend BMD testing and vertebral imaging to those who have had an adult age fracture, to determine degree of disease severity  
  ➢ Individuals with a condition (e.g., rheumatoid arthritis) or on a medication (e.g., glucocorticoids Prednisone ≥ 5mg for ≥ 3 months) associated with bone loss  
  ➢ Anyone considered for pharmacologic therapy | • For men > 50 years and postmenopausal women, T-scores are preferred. BMD results by central dual energy X-Ray absorptiometry (DXA), T-score at the lumbar spine, hip or femoral neck:  
  ➢ Normal: BMD T-score ≥ -1  
  ➢ Low bone density (osteopenia): BMD T-score between -1 and -2.5  
  ➢ Osteoporosis: BMD T-score ≤ -2.5  
  • For premenopausal women, men < 50 years and children, ethnic adjusted Z-scores are preferred.  
  ➢ Z-score of ≤ -2 is in the low range for expected age.  
  ➢ Z-score > -2 is within expected range for age. | • Order BMD as appropriate.  
  NOTE: only T-scores from DXA can be utilized in the WHO diagnostic classification  
  • BMD testing can be performed by:  
  ➢ DXA scan  
  ➢ Peripheral DXA (pDXA). pDXA is not appropriate to monitor response to treatment  
  • Quantitative computed tomography (QCT)  
  • Peripheral QCT (pQCT)  
  • QCT and pQCT are associated with more radiation exposure than DXA or pDXA.  
  ➢ Quantitative ultrasound (QUS) does not measure BMD directly and cannot be used to monitor response to treatment  
  • Bone measurement from different devices cannot be compared  
  • If bone density testing is not available, vertebral imaging may be considered based on age alone(1) | • Repeat BMD by DXA 1-2 years after initiating therapy to reduce fracture risk and every 2 years thereafter(1)  
  • More frequent monitoring may be warranted in certain clinical situations(1)  
  • The interval between repeat BMD screening may be longer for patients without major risk factors and who have an initial T-score in the normal or upper low bone mass range(1) |
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| - Anyone not on therapy in whom bone loss would lead to treatment | - Postmenopausal women discontinuing hormone therapy should be considered for BMD testing | - Vertebral imaging should be performed: (1) 
  - In all women ≥ 70 years and all men ≥ 80 years if BMD-T is ≤ -1.0 at the spine, total hip or femoral neck(1) 
  - In women age 65 to 69 years and men age 70 to 79 years if BMD T-score is ≤ -1.5 at the spine, total hip or femoral neck(1) 
  - In postmenopausal women and men age ≥ 50 years of age with specific risk factors: (1) 
    - Low trauma fracture during adulthood (age 50)(1) | | |
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| o Historical height loss of 1.5 inches or more (4cm) \(^{(1)}\)  
 o Prospective height loss of 0.8 inches or more (2cm\(^2\))  
 o Recent or ongoing long term glucocorticoid treatment \(^{(1)}\) | | | | |
| o Consider use of biochemical markers of bone turnover. These markers may:  
 ➢ Predict risk of fracture independently of bone density in untreated patients  
 ➢ Predict rapidity of bone loss in untreated patients  
 ➢ Predict extent of fracture risk reduction when repeated after 3-6 months of treatment with FDA-approved therapies  
 ➢ Predict magnitude of BMD increases with | | | | |
### Pharmacologic Management of High Risk Patients (1,2,4,5,6,22)

- Initiate pharmacologic treatment for (22)
  - Diagnosis of Osteoporosis
  - Hip or vertebral fractures in absence of major trauma (clinical or asymptomatic)
  - T-score ≤ -2.5 at the femoral neck, total hip or lumbar spine

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<td>FDA-approved therapies</td>
<td>Help determine adequacy of patient compliance and persistence with osteoporosis therapy</td>
<td>Help determine duration of &quot;drug holiday&quot; and when and if medication should be restarted</td>
<td>All treatment programs and monitoring must be individualized by healthcare provider. (22) Current FDA-approved pharmacological treatments:</td>
<td>Repeat BMD testing 1-2 years after initiating therapy and every 2 years thereafter (1)</td>
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<td>· Obtaining samples in the early morning after an overnight fast can reduce biological variability (1)</td>
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<td>by Dxa after ruling out secondary causes</td>
<td>Diagnosis of Osteopenia</td>
<td>Measurements and values</td>
<td>FDA recommends non-estrogen therapy first if only treating osteoporosis</td>
<td>Bisphosphonates: Gastrointestinal (GI) side effects</td>
</tr>
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<td>➢ Diagnosis of Osteopenia</td>
<td>➢ Men over 50 years and postmenopausal women with low bone mass (T-score between -1.0 and -2.5, osteopenia) and 10 year probability of hip fracture ≥ 3% or 10 year probability of any osteoporosis related fracture ≥ 20% based on WHO absolute fracture risk model (FRAX®)</td>
<td>➢ Estrogen agonist/antagonist (formerly known as selective estrogen receptor modulators (SERMs) i.e., Raloxifene)</td>
<td>Bisphosphonates have been found to be associated with osteonecrosis of the jaw and visual disturbances. Consider dental evaluation prior to initiating IV bisphosphonate therapy if systemic conditions permit (SEE: FDA Alerts)</td>
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<td>➢ Men over 50 years and postmenopausal women with low bone mass (T-score between -1.0 and -2.5, osteopenia) and 10 year probability of hip fracture ≥ 3% or 10 year probability of any osteoporosis related fracture ≥ 20% based on WHO absolute fracture risk model (FRAX®)</td>
<td>➢ Parathyroid Hormone (PTH) (1-84), (teriparitide 1-34 amino acid peptide):</td>
<td>➢ Is used for a maximum of two years. Safety and efficacy has not been demonstrated beyond two years of treatment</td>
<td>Zoledronic acid (Reclast) On Sept 1, 2011, the FDA issued an update to the drug label for Reclast regarding the risk of kidney failure (SEE: FDA Alerts)</td>
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<td>➢ Is contraindicated in anyone with increased risk for osteosarcoma or those having prior radiation therapy of the skeleton or prior skeletal malignancy (black box warning)</td>
<td>Raloxiphene increases risk of deep vein thrombosis</td>
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<td>➢ Is contraindicated in anyone with increased risk for osteosarcoma or those having prior radiation therapy of the skeleton or prior skeletal malignancy (black box warning)</td>
<td>➢ RANKL inhibitor: Prolia (denosumab)</td>
<td>&quot;No pharmacological therapy should be considered indefinite in duration. After the initial treatment period, which depends on the</td>
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<td>➢ RANKL inhibitor: Prolia (denosumab)</td>
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NOTE: The WHO BMD diagnostic classification should not be applied to premenopausal women, men < 50, & children. It only applies to previously untreated patients. The WHO fracture risk assessment tool is available at: http://www.shef.ac.uk/FRAX/
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| Secondary Causes of Osteoporosis (1) | • Evaluate and treat secondary causes of osteoporosis | • Some secondary causes include:  
  ➢ Genetic factors  
  ➢ Hypogonadal states  
  ➢ Endocrine disorders  
  ➢ Gastrointestinal disorders  
  ➢ Hematologic disorders  
  ➢ Rheumatic and autoimmune diseases  
  ➢ Miscellaneous conditions and diseases such as Chronic Heart Failure (CHF), depression, emphysema, end-stage renal disease, parenteral nutrition, gastric by-pass, post-transplant  
  ➢ Medications such as anticoagulants, anticonvulsants, | • Order appropriate laboratory tests as indicated | pharmacological agent, a comprehensive risk assessment should be performed. There is no uniform recommendation that applies to all patients and duration decisions need to be individualized. (1) |
|                      |         |                                          |              |           |

1. Evaluate and treat secondary causes of osteoporosis

2. Some secondary causes include:
   - Genetic factors
   - Hypogonadal states
   - Endocrine disorders
   - Gastrointestinal disorders
   - Hematologic disorders
   - Rheumatic and autoimmune diseases
   - Miscellaneous conditions and diseases such as Chronic Heart Failure (CHF), depression, emphysema, end-stage renal disease, parenteral nutrition, gastric by-pass, post-transplant
   - Medications such as anticoagulants, anticonvulsants,
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<td>Immunizations (7)</td>
<td>• Influenza Vaccination</td>
<td>• Document patient has an influenza vaccination each year and document if adverse event occurs</td>
<td>• Administer vaccination yearly</td>
<td>• Yearly</td>
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<td>• Pneumonia Vaccination</td>
<td>• Document patient has received a pneumonia vaccination and document if adverse event occurs</td>
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<td>Tobacco Use (9, 16, 22)</td>
<td>• Provide smoking cessation counseling and other forms of treatment as a routine component of care</td>
<td>• Use of tobacco products is detrimental to the skeleton as well as overall health(1)</td>
<td>• Think: 5 A's(11)</td>
<td>• Follow-up should begin within the first week after quit date. Second follow-up with the first month(9)</td>
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<td>• Advise all individuals not to use tobacco products, or e-cigarettes(15)</td>
<td>• Tobacco use patterns</td>
<td>• Ask about smoking</td>
<td>• In person</td>
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<td>• Advise no exposure to environmental tobacco smoke at work, home and public place (16)</td>
<td>• Prior attempts to quit</td>
<td>• Advise to quit</td>
<td>• Via telephone</td>
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<td>• Readiness assessment</td>
<td>• Assess willingness to quit</td>
<td>• Assess at each visit: smoking status, weight gain, nicotine withdrawal symptoms</td>
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<td>• Combination therapy with counseling and medications is more effective than either component alone</td>
<td>• Assist user to quit (i.e., refer to smoking cessation program and consider pharmacotherapy)</td>
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<td>• Use of e-Cigarettes(10, 22)</td>
<td>• Arrange follow-up</td>
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- chemo therapy, lithium, barbiturates

- Immunizations
- Influenza Vaccination
- Pneumonia Vaccination

- Think: 5 A's:
  - Ask about smoking
  - Advise to quit
  - Assess willingness to quit
  - Assist user to quit (i.e., refer to smoking cessation program and consider pharmacotherapy)
  - Arrange follow-up

- Administration of appropriate vaccine as indicated:
  - PCV13 (pneumococcal conjugate vaccine)
  - PPSV23 (pneumococcal polysaccharide vaccine)

- Follow-up should begin within the first week after quit date. Second follow-up with the first month:
  - In person
  - Via telephone

- Assess at each visit: smoking status, weight gain, nicotine withdrawal symptoms
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| e-cigarettes are not supported as an alternative to smoking or to facilitate smoking cessation | • Alcohol is associated with relapse so patients should consider limiting and/or abstaining from alcohol while quitting tobacco (9)  
• Anticipate triggers or challenges that may occur when stopping tobacco. Discuss these with the patient so they can develop a plan to deal successfully with issues that arise (9) | | First line pharmacotherapy adjuvants (9,10,22) | |
| *Factors to consider when choosing a pharmacotherapy* (9) | | | ➢ Nicotine replacement  
➢ Sustained-release bupropion  
➢ Varenicline | |
| *Clinician familiarity with the medications and contraindications for selected patients*  
➢ Previous patient experience with a specific pharmacotherapy (positive or negative)  
➢ Patient characteristics (e.g., history of depression, concerns about weight gain) | | | e-Cigarettes (10,22) | |
| • Not FDA approved or regulated  
• Not enough information about safety or effectiveness for cessation | | | One of the FDA-approved safe and effective cessation medications is recommended | |

First line pharmacotherapy adjuvants (9,10,22)  
➢ Nicotine replacement  
➢ Sustained-release bupropion  
➢ Varenicline  
• Not FDA approved or regulated  
• Not enough information about safety or effectiveness for cessation One of the FDA-approved safe and effective cessation medications is recommended |

| DEPRESSION SCREENING (18-20) | Screen for presence of depression in adults aged ≥18 years, including | Use validated depression screening tool such as the Patient Health | USPSTF recommends screening all adults who have not been screened previously (19) | Screening is suggested at subsequent visits |

**Depression Screening** (18-20)  
➢ Screen for presence of depression in adults aged ≥18 years, including  
• Use validated depression screening tool such as the Patient Health  
• USPSTF recommends screening all adults who have not been screened previously (19)  
• Screening is suggested at subsequent visits
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<td>pregnant and postpartum women (^{(19)})</td>
<td>Have an adequate system in place to assure an accurate diagnosis, effective treatment, and appropriate follow-up (^{(19)})</td>
<td>Questionnaire (PHQ-2 or PHQ-9), Hospital Anxiety and Depression Scales in adults, the Geriatric Depression Scale in older adults, and the Edinburgh Postnatal Depression Scale (EPDS) in postpartum and pregnant women (^{(18,20)})</td>
<td>Use clinical judgement and consideration of risk factors, comorbid conditions, and life events to determine if additional screening of high-risk patients is warranted (^{(19)})</td>
<td>Evaluate response to depression treatment with individualized follow-up contacts and adjust medication as indicated and/or confer with mental health specialist.</td>
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<td>- Risk factors among the general adult populations vary by sex, age, race/ethnicity, education, marital status, geographical location, and employment status. Women, young and middle-aged adults, and nonwhite persons have higher rates depression than their counterparts, as do persons who are undereducated, previously married or unemployed (^{(19)})</td>
<td>- Other groups at increased risk of developing depression are persons with chronic illnesses (e.g., cancer or cardiovascular disease), other mental health disorders (including substance misuse, or a family history of psychiatric disorders) (^{(19)})</td>
<td>- Administer treatment and/or refer patients who meet criteria for depression to a mental health specialist</td>
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\(^{(18)}\) [Reference](#) \(^{(20)}\) [Reference](#)
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|                      |         | • Risk factors in older adults include disability, poor health status related to medical illness, complicated grief, sleep disturbances, loneliness, and history of depression age (19)  
• Effective treatment of depression in adults generally includes antidepressants or specific psychotherapy approaches (e.g. CBT or brief psychosocial counseling), alone or in combination (21) |             |          |

This guideline is intended as an educational reference and not as a substitute for the clinical judgment of the treating physician concerning appropriate and necessary care for a specific patient. This guideline is based on the clinical references listed at the end of the document. Note that a specific treatment or therapy listed may not be a covered benefit for all individuals. Please check the individual’s eligibility and benefits plan.
### REFERENCE LIST

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<th>Publication Date</th>
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<tr>
<td>10.</td>
<td>Naftilan, Allen J., Associate Professor of Medicine, Vanderbilt University Medical School; Clinical Director, The Heart Failure Program, The Vanderbilt Heart Institute, Nashville, Tennessee</td>
<td>Naftilan, Allen J.</td>
<td>2012</td>
<td><a href="http://www.ahrq.gov/professionals/clinicians-providers/guidelines-recommendations/tobacco/prescrib.pdf">http://www.ahrq.gov/professionals/clinicians-providers/guidelines-recommendations/tobacco/prescrib.pdf</a></td>
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