Osteoporosis: Prevention, Screening, and Treatment in the Primary Care Setting

Current recommendations for osteoporosis prevention, screening and treatment in the primary care setting

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Prevention

Studies indicate peak bone mass is achieved in the third decade of life which means interventions promoting skeletal health would be best directed at maximizing peak bone mass in adolescence through a patient's early thirties.
Bone mineral density (BMD) can be improved with nutrition and medication, but the microarchitectural changes that accompany bone loss are not reversible and will result in poorer quality of bone despite the gains in BMD.
Weight-bearing exercise has been shown to promote accumulation of bone and is essential in maintaining bone once maximal bone density has been reached.
The importance of exercise in the development and maintenance of a healthy skeleton should be stressed along with those benefits more commonly discussed, such as weight loss, cardiovascular health, and glucose metabolism.
Cigarette smoking and excessive EtOH have also been linked to low BMD and the avoidance of these behaviors should be promoted in osteoporosis interventions:

- moderate EtOH (< 2 drinks per day) has been linked to improved bone health in some studies, but it is not recommended that patients start drinking to reduce their risk of osteoporosis.

While it is established that calcium and vitamin D are essential to building and maintaining healthy bone, studies examining the benefits of supplemental calcium and vitamin D are conflicting.
Healthy children and adults eating a varied diet do not necessarily need supplements, but they are considered a reasonable option if daily intake does not meet the recommendations:

	calcium	**vitamin D**
9 to 18 years old:	1300mg	600 IU
19 to 50 yrs old:	1000mg	600 IU
51 to 70 male:	1000mg	600 IU
51 to 70 female:	1200mg	600 IU
> 70:	1200mg	800 IU

Special populations: anorexia nervosa, inflammatory bowel disease, celiac disease, and cystic fibrosis can all impair optimal growth of bone during adolescence and young adulthood, and care should be taken to meet nutritional recommendations and to monitor bone health in these patients. Remember to consider the effects of diuretics and PPIs on calcium homeostasis.

KEY POINTS: Osteoporosis is largely preventable. Based on the current understanding of the disease process, preventative measures including adequate calcium and vitamin D intake, weight-bearing exercise, and lifestyle modifications should be targeted to adolescents. There

are at-risk populations besides postmenopausal women, and they would benefit from counseling and screening.

Screening

Screening for osteoporosis is typically done by low dose dual-energy x-ray absorptiometry (DXA or DEXA scan) of the hip and lumbar spine. According to the USPSTF recommendations (2011):

- Screen women age 65 years and older who have no known fractures or secondary causes of osteoporosis (Grade B).
- Screen women < 65 years whose 10-year fracture risk is equal to or greater than that of a 65-year-old white woman of average risk (calculated to be 9.3% using the FRAX fracture risk assessment tool) (Grade B).
- There is no recommendation for screening of men without fracture or secondary causes of osteoporosis (Grade I).
- Utilization of the WHO FRAX fracture risk assessment tool allows the practitioner to calculate risk with or without a BMD measurement. Access the tool at www.shef.ac.uk/FRAX

There is a lack of evidence regarding **screening intervals**, and the USPSTF does not have a recommendation. Medicare covers repeat screenings every 24 months, but this interval is not supported by data and is likely resulting in over-utilization. Gourlay et al. (2012) concluded that <10% of women with normal BMD to mild osteopenia by DXA will progress to osteoporosis in <15 years. Moderate osteopenia (T-score -1.5 to -1.99) to osteoporosis took 5 years, and advanced osteopenia (T-score -2.00 to -2.49) took 1 year.

KEY POINTS: There is sufficient evidence to support screening of certain populations. There are validated tools (e.g. FRAX) to aid in clinical decision making regarding populations who may be at risk but are outside the age range typically screened. The natural history of the disease and how the results will impact treatment should be considered when deciding on screening intervals.

Treatment

The American College of Physicians (ACP) recommends the following:

- Pharmacologic treatment of both men and women with known osteoporosis (T-score < -2.5) or those with prior fragility fractures (strong recommendation, high quality evidence).
- Consideration of pharmacologic treatment of men and women at risk for developing osteoporosis (weak recommendation, moderate quality evidence).
- The choice of pharmacologic treatment for osteoporosis in men and women should be based on an assessment of risk and benefits in individual patients (strong recommendation, moderate-quality evidence).

Many organizations, including the National Osteoporosis Foundation recommend pharmacotherapy in osteopenic patients whose **10-year probability of hip fracture or major osteoporotic fracture is greater than or equal to 3% or 20%, respectively.**
Treatment options include **bisphosphonates** and selective estrogen receptor modulators (**SERMs**). The most recent Up-to-Date article (search term "osteoporosis treatment") on treatment recommends the bisphosphonates alendronate or risedronate, both at 35mg/wk or 5mg daily, as effective, affordable, and with adequate safety data to support their usage. Bisphosphonates as a class have the potential to cause abdominal pain, nausea, dyspepsia, gastritis, musculoskeletal pain, and transient hypocalcemia. These side effects will typically resolve with discontinuation of the drug.
The SERM raloxifene 60mg daily is an option for postmenopausal women, but it carries the risk of thromboembolic events and hot flashes. Estrogen may be used in certain circumstances but the risks likely outweigh the benefits in the majority of cases. Bisphosphonates are appropriate monotherapy in both men and women.

References

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