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FROM THE FAMILY PRACTICE INQUIRIES NETWORK

Is osteoporosis screening in postmenopausal women effective?

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EVIDENCE-BASED ANSWER

No single study evaluates the effectiveness of osteoporosis screening. However, screening women over the age of 65 years—or those between 60–64 years with certain risk factors—is recommended based on available evidence.

First, osteoporosis is common, and its prevalence increases with age (strength of recommendation [SOR]: **A**—prospective cohort studies). Second, low bone mineral density predicts fracture risk (SOR: **A**—prospective cohort studies). Finally, the likelihood of osteoporotic fracture is reduced with therapy, such as alendronate 10 mg/day or risedronate 5 mg/day plus adequate daily calcium and vitamin D (SOR: **A**—meta-analysis of randomized clinical trials).

Women under 60 years should not be screened (SOR: **B**—clinical decision rule). There is no evidence to guide decisions about screening interval or at what age to stop screening. The long-term risks of newer medications used for osteoporosis are unknown.

EVIDENCE SUMMARY

Osteoporosis results in significant morbidity and mortality. In a prospective observational study of women over 50 years of age, 39.6% had osteopenia and 7.2% had osteoporosis. Osteoporosis was associated with a fracture rate 4 times that of normal bone mineral density.[1] People with vertebral or hip fractures have a reduced relative 5-year survival of 0.81. Excess mortality occurred within the first 6 months following fracture.[2]

One prospective cohort study identified 14 independent risk factors for hip fracture.[3] The best predictors were female gender, age, low weight, and no current estrogen use. For women aged >65 years with no other risks, 12% to 28% have osteoporosis.[4] Multiple risk assessment scales have been studied to identify women aged >65 years who are at increased risk; however, none of the scales had good discriminatory performance.[5] As a

result, it is unclear which factors for women under 65 years should trigger screening.

While multiple technologies exist to measure bone mineral density, dual-energy x-ray absorptiometry (DEXA) has been the most validated test for predicting fractures. A meta-analysis of 11 prospective cohort trials showed that all sites of bone mineral density measurements correlated with fractures (relative risk [RR], 1.5; 95% confi-dence interval [CI], 1.4–1.6.). However, DEXA of the femoral neck predicted hip fracture better than other measures (RR, 2.6; 95% CI, 2.0–3.5).[6]

Additionally, heel ultrasonography was compa-rable with hip DEXA for predicting hip fractures for women over 65 years (probability of fracture 0.018 vs. 0.023); no studies have compared effec-tiveness for women under 65 years.

Multiple therapeutic interventions for osteo-porosis have been demonstrated to reduce frac-tures. Adequate calcium and vitamin D appear to prevent fractures. Alendronate and rise-dronate are the only prescription medications with evidence showing they prevent hip fractures.

A meta-analysis of 11 randomized controlled trials including 11,808 women found fewer hip fractures in women taking 10 mg/day of alendronate (RR, 0.51; 95% CI, 0.38–0.69; number needed to treat [NNT]=24), and fewer vertebral fractures in women taking 5 mg/day of alendronate (RR, 0.52; 95% CI, 0.43–0.65; NNT=72).[7]

For these results to apply to screening, study participants must be similar to those identified by general population screening. All trials included healthy women with low bone mineral density who were not using estrogen, which is similar to women identified by general screening. However, 57% of women recruited for the second Fracture Intervention Trial (FIT-II), the largest study, were classified as ineligible. This raises concern about the study's generalizability.[8]

The US Preventive Services Task Force did an outcomes estimation of screening effectiveness, combining all of the above data (**Table**).[9] Screening 731 women aged 65 to 69 years would prevent 1 hip fracture if those with indications for treat-ment took it; screening 248 women would prevent 1 vertebral fracture. As the **table** demonstrates, benefits increase with age. For women under 65 years, benefits are relatively small, unless they have other risk factors for osteoporosis.

Hip and vertebral fracture outcomes for osteoporosis screening in 10,000 postmenopausal women[9]

		Age (years)	
Screening outcomes	**55–59**	**65–69**	**75–79**
Identified with osteoporosis	445	1200	2850
Hip fracture prevented with medication	2	14	70
NNS to prevent 1 hip fracture	4338	731	143

NNT to prevent 1 hip fracture	193	88	41
Vertebral fractures prevented	7	40	134
NNS to prevent 1 vertebral fracture	1338	248	75
NNT to prevent 1 vertebral fracture	60	30	21
The calculations in this table assume that treatment reduces the risk of vertebral fracture by 48%, the risk of hip fracture to 36%, and that 70% of patients will adhere to therapy. Table modified from USPSTF report.[9]			
NNS, number needed to screen for benefit; NNT, number needed to treat for benefit			

RECOMMENDATIONS FROM OTHERS

Based on their outcomes model, the US Preventive Services Task Force recommends screening for women aged >65 years, and those aged 60 to 65 years who have risk factors.[9] In 1998, the National Osteoporosis Foundation, in collaboration with many other professional organ-izations, recommended bone mineral density test-ing for all women aged >65 years and younger postmenopausal women who have had or are at risk for fractures.[10] The 2000 Consensus Development Conference from the National Institutes of Health recommended an individual-ized approach to screening, stating evidence for universal osteoporosis screening is inconclusive.[11] The American Association of Clinical Endo-crinologists revised guidelines in 2001 to include screening younger postmenopausal women with a body weight <127 lbs or a family history of nontraumatic spine or hip fracture.[12]

CLINICAL COMMENTARY

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The value of screening for osteoporosis is a much bigger issue for clinicians since the pub-lication of the Women's Health Initiative study and the consequent decline in the number of postmenopausal women using HRT. Evidence for pharmacologic prevention of fractures in women who do not meet conventional criteria for osteoporosis is lacking. Data on fracture risk with osteoporosis are short-term, and the risks and benefits of long-term treatment of women who do have osteoporosis are unknown for all of the treatment options.

The conclusion to focus our screening efforts on women aged 65 years and older, where the near-term benefits seem to clearly outweigh the risks, is certainly clinically prudent. Irrespective of our wishes, many women in their fifties are getting osteoporosis screening at health fairs or shopping malls. Although I do not encourage this age group to be

screened, when faced with results showing osteoporosis, I do still treat with a bisphosphonate, based on the trials noted above.

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