Are antibiotics effective for otitis media with effusion?

EVIDENCE-BASED ANSWER

Antibiotics provide little or no long-term benefit for children with otitis media with effusion (OME), defined as fluid in the middle ear without signs or symptoms of infection.

Most meta-analyses show a modest, short-term reduction in effusion rates. However, the most rigorous meta-analysis shows no benefit (strength of recommendation [SOR]: **D**, based on conflicting meta-analyses). No significant effect was noted on longer-term (>1 month) outcomes after treatment (SOR: **A**, based on a meta-analysis of 8 trials). In addition, there is no reliable evidence regarding patient-oriented outcomes (hearing loss, speech delay).

EVIDENCE SUMMARY

Longitudinal studies show spontaneous resolution in more than half of children within 3 months of the development of the effusion. After 3 months, the rate of spontaneous resolution remains constant, so that only a small percentage of children have OME a year or longer. There is a theoretical basis for the use of antibiotics for OME, since between 27%–50% of middle-ear aspirates of patients with OME contain bacteria.[1]

In the last 10 years, 4 meta-analyses reported mild short-term improvement in OME with antibiotic treatment (effusion clearance rates of 23%,[2] 16%,[3] 14%,[1] and 4%,[4] respectively—see **Table**). The last study was the only meta-analysis that restricted inclusion to only randomized, blinded, placebo-controlled trials. The small difference reported (4%) was not significant. None of the studies that assessed outcomes beyond a month showed a significant difference in the persistence of OME.

The meta-analyses vary significantly in methodology, inclusion/exclusion criteria, and interpretation, making a definitive conclusion on treatment results difficult. The included trials varied in antibiotics chosen, use of placebo, duration of therapy, time to measurement of OME resolution, and method of diagnosis (tympanography, otoscopy, audiometry).

The reviews commented on potential harms of antibiotic therapy, including medication cost and the development of antibiotic resistance. Nausea, vomiting, and diarrhea were reported in 2%–30% of children on antibiotic therapy.[1] The reviews did not address the treatment of OME in the nonpediatric population or such long-term patient-oriented outcomes as hearing loss or speech delay.

RECOMMENDATIONS FROM OTHERS

The American Academy of Pediatrics (AAP), the American Academy of Family Physicians (AAFP),

CONTINUED

What is a Clinical Inquiry?

Clinical Inquiries answer real questions that family physicians submit to the Family Practice Inquiries Network (FPIN), a national, not-for-profit consortium of family practice departments, residency programs, academic health sciences libraries, primary care practice-based research networks, and individuals with particular expertise.

Questions chosen for Clinical Inquiries are those considered most important, according to results of web-based voting by family physicians across the U.S.

Answers are developed by a specific method:

- First, extensive literature searches are conducted by medical librarians.
- Clinicians then review the evidence and write the answers, which are then peer reviewed.
- Finally, a practicing family physician writes a commentary.

TABLE

Meta-analyses of otitis media with effusion

Meta-analysis	# of trials	Number of subjects	Description	Rate difference (95% CI)
Cantekin et al[4]	8	775 children	Includes only non-placebo-controlled RCTs. Variable timing of outcome measure	32 (25.8–38.8)
Rosenfeld et al[2]	10	1325 children	Includes some nonblinded and non-placebo-controlled RCTs. Variable timing	22.8 (10.5–35.1)
Williams et al[3]	12	1697 children	Includes some nonblinded and non-placebo-controlled RCTs. Short-term outcomes focused on bilateral resolution of OME within 1 month of starting therapy	16 (3–29)
Williams et al[3]	8	2052 ears	Includes some nonblinded and non-placebo-controlled RCTs. Short-term outcomes focused on unilateral resolution of OME within 1 month of starting therapy	25 (10–40)
Williams et al[3]	8	1313 ears	Includes some nonblinded and non-placebo-controlled RCTs. Long-term outcomes measured more than 1 month after treatment was completed	6 (-3–14)
Stool et al[1]	10	1041 children	All blinded RCTs. Not all placebo-controlled. Variable timing	14.0 (3.6–24.2)
Cantekin et al[4]	8	1292 children	Includes only blinded, placebo-controlled RCTs. Variable timing	4.3 (-0.1–8.6)

RCT, randomized clinical trial; CI, confidence interval; OME, otitis media with effusion

and the American Academy of Otolaryngology–Head and Neck Surgery participated in the meta-analysis by Stool et al,[1] under contract with the Agency for Health Care Policy and Research. The resulting clinical practice guideline has been adopted by the AAP, AAFP, and the Centers for Disease Control and Prevention. The guideline stresses that observation *or* antibiotics are treatment options for children with OME present less than 4 to 6 months. Antibiotic therapy is never considered a required treatment for OME of any duration. All published guidelines are applicable to the pediatric population only.

Conflicting evidence indicates short-term or no benefit for antibiotics, and complications such as nausea, vomiting, diarrhea, and rash have been reported in 2%–32% of children. Long-term antibiotics lead to poor adherence, more office visits, and antibiotic resistance.[5]

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CLINICAL COMMENTARY

Conflicting meta-analyses and a guideline that hedges leaves the clinician who practices evidence-based medicine in the uncomfortable position of saying "maybe" when asked

Otitis media with effusion

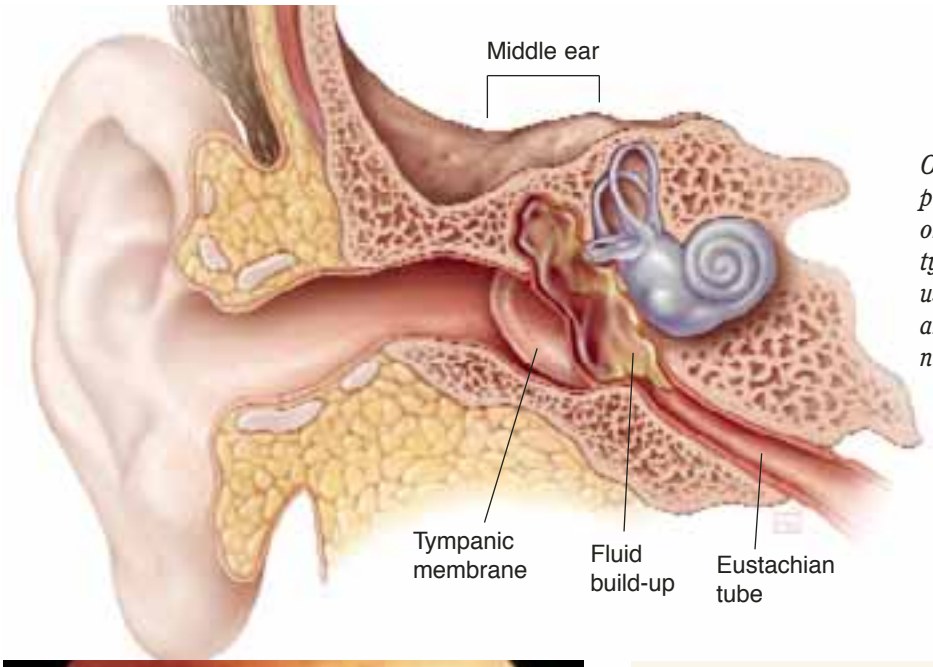


ILLUSTRATION BY STEVE OH

Otitis media with effusion produces characteristic findings on otoscopic examination and tympanometry. The condition usually resolves spontaneously, and antibiotic treatment does not hasten resolution.

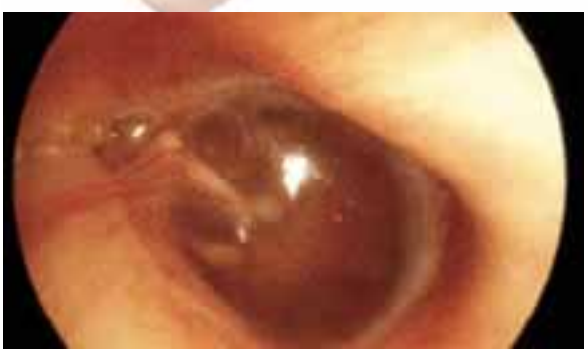
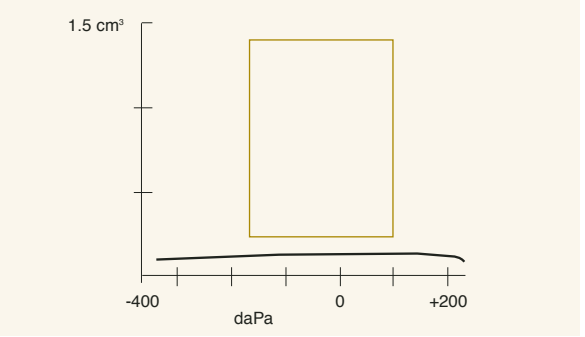


IMAGE © CLINICA CLAROS

Fluid build-up in the middle ear causes the tympanic membrane to become somewhat opaque and appear orange or gray on otoscopic examination.



Fluid causes the tympanic membrane to become rigid, resulting in a nearly flat pressure curve on the tympanogram.

whether antibiotics are helpful. In the majority of cases of OME, I would seek to avoid the possible complications of antibiotics, given that there is no clear benefit. I await more data on speech and hearing outcomes in OME, as these studies will provide the most helpful evidence to primary care physicians.

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REFERENCES

1. Stool SE, Berg AO, Berman S, et al. Otitis media with effusion in young children. Clinical Practice Guideline No. 12. AHCPR Publication 94-0622. Rockville, Md: Agency for Health Care Policy and Research, Public Health Service, US Department of Health and Human Services, July 1994.
2. Rosenfeld RM, Post JC. Meta-analysis of antibiotics for the treatment of otitis media with effusion. *Otolaryngol Head Neck Surg* 1992; 106:378–386.
3. Williams RL, Chalmers TC, Stange KC, Chalmers FT, Bowlin SJ. Use of antibiotics in preventing recurrent acute otitis media and in treating otitis media with effusion. A meta-analytic attempt to resolve to brouhaha. *JAMA* 1993; 270:1344–1351.
4. Cantekin EI, McGuire TW. Antibiotics are not effective for otitis media with effusion: reanalysis of meta-analyses. *Otorhinolaryngol Nova* 1998; 8:214–222.
5. Williamson I. Otitis media with effusion. *Clinical Evidence* [online]. Available at: http://www.clinicalevidence.com. Accessed on February 24, 2003.

What nonhormonal therapies are effective for postmenopausal vasomotor symptoms?

EVIDENCE-BASED ANSWER

Regular exercise may reduce vasomotor symptoms of menopause (strength of recommendation [SOR]: **C**—single observational study).[1]

Soy products/isoflavones, either through diet or supplementation, may reduce the incidence of hot flushes (SOR: **D**—inconsistent results of randomized trials).[2]

Clonidine, as an oral or transdermal preparation, reduces hot flushes (SOR: **A**—randomized clinical trials),[3] as does gabapentin (SOR: **A**—single randomized clinical trial).[4]

In cancer patients who have had surgical menopause, selective serotonin reuptake inhibitors[5] and megestrol[6] (Megase) have been effective in reducing hot flushes (SOR: **A; B** for extrapolation to the general population).

Other therapies—including Bellergal (a combination of belladonna, ergotamine, and phenobarbital), methyldopa, evening primrose oil, mai quan, flaxseed, ginseng, and topical wild yam extract—have not been effective.[7] Black cohosh may be effective, but the evidence for this is of poor quality (SOR: **C**). (See **Table**.)

TABLE

Nonhormonal therapies for postmenopausal vasomotor symptoms

Agent	Effective	SOR†	Comments
Soy/isoflavones	Maybe	D	Multiple RCTs with conflicting results, no formal meta-analysis. Does have a positive effect on lipid profile
Clonidine (Catapres)	Yes	A	Multiple small RCTs
Venlafaxine* (Effexor)	Yes	B	Single RCT
Fluoxetine* (Prozac)	Yes	B	Single RCT
Gabapentin (Neurontin)	Yes	A	Single RCT
Megestrol* (Megace)	Yes	B	Single RCT
Exercise	Maybe	C	Single observational study
Black cohosh	Maybe	C	German E commission recommendation positive in 1989, but only 1 of 7 trials cited had placebo control. Recent RCT showed no benefit
Other: Bellergal, methyldopa, evening primrose oil, ginseng, wild yam extract, mai quan, flaxseed	No	C	All have been advocated but no positive trials for any evidence of effect

*Trials conducted only with patients with breast cancer and interventional menopause, most of whom were on anti-estrogen therapy.

†See page 290 for a description of strength of recommendation.

SOR, strength of recommendation; RCT, randomized controlled trial

EVIDENCE SUMMARY

Hormone replacement therapy (HRT) is the standard treatment for vasomotor symptoms of menopause, and it is effective for this indication. With recent studies showing no benefit from long-term HRT for menopausal women and increased adverse effects with its use (especially for women at risk for coronary heart disease), there has been increased interest in nonhormonal treatments for these symptoms.

A small number of randomized clinical trials have studied treatments other than HRT for the control of vasomotor symptoms of menopause. As a group, these trials have been short-term and have involved small numbers of patients. A disproportionate number of trials have been completed in breast cancer survivors, since these patients tend to have more severe vasomotor symptoms as a result of their anti-estrogenic therapies. Whether these results can be generalized to all postmenopausal women with vasomotor symptoms cannot be determined from the evidence.

Eleven randomized trials of *soy protein/isoflavone* used placebo controls. Results were mixed, with 7 trials showing no effect and 4 showing a reduction in hot flushes in comparison with placebo. Studies reporting a positive effect showed approximately a 15% reduction in episodes in comparison with placebo. In one 6-month trial, there was a correlation between hot flushes and urinary isoflavone excretion regardless of treatment group, suggesting a confounding effect of dietary intake of isoflavone.

Five of six randomized controlled trials of *clonidine* have shown a reduction in frequency of hot flushes ranging from 14%–50% compared with placebo. One trial, which used oral clonidine 0.1 mg daily, also reported an improved quality of life for the treatment group. A single randomized trial has shown that *gabapentin,* at a dose of 900 mg/day, is effective in reducing both frequency and severity of hot flashes.[4]

Trials of specific *selective serotonin reuptake inhibitors* have been completed in patients with vasomotor symptoms secondary to breast cancer therapies. Individual randomized controlled trials of venlafaxine and fluoxetine have proven these agents effective, and a preliminary open-labeled trial of paroxetine has also suggested benefit.

Several reviews suggest *black cohosh* may be effective for short-term treatment, and it is used in Germany for this indication. The trials we found were not placebo-controlled, however, and the safety of this agent is controversial. A single English-language placebo-controlled trial did not show any benefit for black cohosh.

RECOMMENDATIONS FROM OTHERS

The American College of Obstetrics and Gynecology clinical management guideline, "The use of botanicals for management of menopausal symptoms," gives a level **C** recommendation (consensus and expert opinion) that "Soy and isoflavone may be helpful in short-term (≤2 years) treatment of vasomotor symptoms" and "black cohosh may be helpful in the short-term (≤6 months) treatment of women with vasomotor symptoms." They note that "given the possibility that these compounds may interact with estrogen, these agents should not be considered free of potential harm in women with estrogen-dependent cancers."[8]

The North American Menopause Society notes that behavior changes, such as moderate exercise and avoidance of hot-flush triggers, may prevent some hot flushes, although there is only anecdotal evidence for this. The efficacy of paced respiration—deep, slow abdominal breathing—to lessen hot flushes has been shown in a small trial. The society states that other alternative therapies have not been shown to be efficacious, except for moderate quantities of soy products.[9]

The Medical Letter says the evidence that phytoestrogens are helpful for menopausal women comes mostly from epidemiological studies. The long-term adverse effects of phytoestrogen consumption are not known.[10]

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CLINICAL COMMENTARY

Behavioral modifications may be the first approach to reduce the incidence of vasomotor symptoms in menopausal women. Recommendations include wearing several layers of breathable clothing; keeping a glass of cold water, ice pack, or small fan by the bedside and nearby at work; performing deep breathing relaxation techniques; and exercising routinely.

Effective nonhormonal treatments include phytoestrogens (≤2 years), black cohosh (≤6 months), clonidine, selective serotonin reuptake inhibitors, and venlafaxine. Overall, there are few well-designed clinical trials regarding the safety and effectiveness of botanical agents used for vasomotor symptoms. Since the Food and Drug Administration does not regulate the marketing and standardization of these products, patients should be advised to purchase products from reputable companies with internal standardization processes.

Additionally, patients should talk with their health care provider prior to initiating any alternative medication to avoid drug-disease and drug-drug interactions.

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REFERENCES

1. Ivarsson T, Spetz AC, Hammar M. Physical exercise and vasomotor symptoms in postmenopausal women. *Maturitas* 1998; 29:139–146.
2. Upmalis DH, Lobo R, Bradley L, Warren M, Cone FL, Lamia CA. Vasomotor symptom relief by soy isoflavone extract tablets in postmenopausal women: a multicenter, double-blind, randomized, placebo-controlled study. *Menopause* 2000; 7:236–242.
3. Pandya KJ, Raubertas RF, Flynn PJ, et al. Oral clonidine in postmenopausal patients with breast cancer experiencing tamoxifen-induced hot flashes: a University of Rochester Cancer Center Community Clinical Oncology Program study. *Ann Intern Med* 2000; 132:788–793.
4. Guttuso T, Kurlan R. McDermott MP, et al. Gabapentin's effects on hot flashes in postmenopausal women: a randomized controlled trial. *Obstet Gynecol* 2003; 101:337–345.
5. Loprinzi CL, Michalak JC, Quella SK, et al. Megestrol acetate for the prevention of hot flashes. *N Engl J Med* 1994; 331:347–352.
6. Loprinzi CL, Sloan JA, Perez EA, et al. Phase III evaluation of fluoxetine for treatment of hot flashes. *J Clin Oncol* 2002; 20:1578–1583.
7. Taylor M. Alternative medicine and the perimenopause: an evidence-based review. *Obstet Gynecol Clin North Am* 2002; 29:555–573.
8. Use of botanicals for management of menopausal symptoms. ACOG Pract Bull No. 28. Washington, DC: American College of Obstetricians and Gynecologists, 2001.
9. Clinical challenges of perimenopause: consensus opinions of the North American Menopause Society. *Menopause* 2000; 7:5–13.
10. Phytoestrogens. *Med Lett Drugs Ther* 2000; 1072:17–18.

What treatments are effective for varicose veins?

EVIDENCE-BASED ANSWER

For larger trunk varicose veins, as in the saphenous vein, therapeutic options include conservative measures (such as leg elevation and compression stockings), injection sclerotherapy, and surgical vein ligation, with or without stripping. Long-term outcomes appear superior with surgical treatment.

For mid-sized reticular veins and spider telangiectasias, several options are available, including sclerotherapy, laser ablation, and thermal ablation. However, no randomized trials have compared the relative effectiveness of these treatments.

Venotonic medications (primarily plant-derived and synthetic flavonoids, such as horse chestnut seed extract, that improve venous tone) provide symptom relief. Head-to-head comparisons are needed to identify the most efficacious therapies (strength of recommendation: **C**, based on case series and extrapolations from small trials.)

EVIDENCE SUMMARY

Graduated elastic compression stockings improve lower-extremity hemodynamics (including reflux and residual volume measured by color flow duplex scanning) in patients with varicosities, and can improve symptoms such as swelling, discomfort, and leg tightness.[1,2]

A Cochrane review concluded that existing evidence supports the use of sclerotherapy for recurrent varicose veins after surgery and

for relatively minor "thread" veins.[3] Data did not show that any particular type of sclerosant or pressure dressing or duration of post-treatment compression have significant effect on outcomes, such as disappearance of varicosities and cosmetic improvement.[3]

A Cochrane protocol is in progress regarding comparison of the outcomes of surgery and sclerotherapy.[4] Few randomized trials have compared surgery and sclerotherapy.

Belcaro reported results of a 10-year randomized trial including 121 subjects, 96 of whom completed the study.[5] Surgery consisted of ligation of the saphenopopliteal junction without stripping. At 10 years, 16.1% of patients receiving surgery plus sclerotherapy had distal venous incompetence (assessed with color duplex scanning and ambulatory venous pressure measurement), compared with 36.4% of those who underwent surgery alone and 43.8% of those who received sclerotherapy alone. The authors concluded that long-term outcomes (defined as saphenofemoral junction competence) are superior with strategies that included surgery, but at greater cost.

Beresford and colleagues also concluded that surgery lessened the likelihood of additional treatment.[6] Another randomized trial showed that saphenous vein stripping reduced by two thirds the need for reoperation due to recurrent saphenofemoral incompetence, compared with saphenofemoral junction ligation alone.[7]

A meta-analysis studied the effectiveness of venotonic medications (such as rutoside, flunarizine, and dihydroergotamine) in chronic venous insufficiency.[8] These agents significantly reduced pain, leg heaviness, cramps, and paresthesias. However, a Cochrane Collaboration reviewer questioned the validity of pooling results from this heterogeneous group of studies into a single meta-analysis.[9]

A Cochrane Review did find that horse chestnut seed extract significantly improves leg pain, edema, pruritus, and lower leg volume and circumference, but suggests that larger randomized trials are needed to establish conclusively this agent's efficacy.[10]

RECOMMENDATIONS FROM OTHERS

A recent clinical review indicated that patients whose main symptoms are swelling or aching can be treated with compression stockings alone; trunk varicosities should be treated with saphenofemoral or saphenopopliteal ligation, plus stripping of the long saphenous vein for long saphenous varicosities.[11] They suggest that sclerotherapy should be reserved for varicosities that persist after surgery.

The Venous Insufficiency Epidemiologic and Economic Studies (VEINES) program recommends sclerotherapy for telangiectasias and reticular veins, and surgery for saphenous varicosities.[12] However, they noted the need for randomized trials to compare therapies.

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CLINICAL COMMENTARY

Choosing the best treatment for varicose veins can be complicated. Symptoms and the type of varicose veins (truncal varices, reticular varices, or telangiectasia) can guide the clinician in selecting therapy. Asymptomatic varicosities can usually be observed without treatment. Patients with symptomatic varicosities may be treated conservatively before referring for invasive treatment.

Surgery is probably the best treatment for truncal varices, whereas sclerotherapy is better for reticular veins or telangiectasia. The long-term risks and benefits of newer modalities such as laser and thermal ablation need further evaluation. Regardless of the treatment chosen, patients with varicose veins should first undergo a thorough investigation.

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REFERENCES

1. Weiss RA, Duffy D. Clinical benefits of lightweight compression: reduction of venous-related symptoms by ready-to-wear lightweight gradient compression hosiery. *Dermatol Surg* 1999; 25:701–704.
2. Labropoulos N, Leon M, Volteas N, Nicolaides AN. Acute and long-term effect of elastic stockings in patients with varicose veins. *Int Angiol* 1994; 13:119–123.
3. Tisi PV, Beverley CA. Injection sclerotherapy for varicose veins (Cochrane Review). In: *The Cochrane Library,* Issue 2, 2002. Oxford: Update Software.
4. Michaels JA, Kendall RJ. Surgery for varicose veins (Protocol for a Cochrane Review). In: *The Cochrane Library,* Issue 2, 2002. Oxford: Update Software.
5. Belcaro G, Nicolaides AN, Ricci A, et al. Endovascular sclerotherapy, surgery, and surgery plus sclerotherapy in superficial venous incompetence: a randomized, 10-year follow-up trial—final results. *Angiology* 2000; 51:529–534.
6. Beresford SAA, Chant ADB, Jones HO, Piachaud D, Weddell JM. Varicose veins: a comparison of surgery and injection/compression sclerotherapy. Five-year follow-up. *Lancet* 1978; 1:921–924.
7. Dwerryhouse S, Davies B, Harradine K, Earnshaw JJ. Stripping the long saphenous vein reduces the rate of reoperation for recurrent varicose veins: five-year results of a randomized trial. *J Vasc Surg* 1999; 29:589–592.
8. Boada JN, Nazco GJ. Therapeutic effect of venotonics in chronic venous insufficiency: a meta-analysis. *Clin Drug Invest* 1999; 18:413–432.
9. Therapeutic effect of venotonics in chronic venous insufficiency: a meta-analysis. In: *The Cochrane Library,* Issue 2, 2002. Oxford: Update Software.
10. Pittler MH, Ernst E. Horse chestnut seed extract for chronic venous insufficiency (Cochrane Review). In: *The Cochrane Library,* Issue 2, 2002. Oxford: Update Software.
11. London NJM, Nash R. ABC of arterial and venous disease. Varicose veins. *BMJ* 2000; 320:1391–1394.
12. Kurz X, Kahn SR, Abenhaim L, et al. Chronic venous disorders of the leg: epidemiology, outcomes, diagnosis and management. Summary of an evidence-based report of the VEINES task force. *Int Angiol* 1999; 18:83–102.

Is osteoporosis screening in postmenopausal women effective?

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).

The best predictors for hip fracture were female gender, age, low weight, and no current estrogen use

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

TABLE

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

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% confidence 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 comparable with hip DEXA for predicting hip fractures for women over 65 years (probability of fracture 0.018 vs. 0.023); no studies have compared effectiveness for women under 65 years.

Multiple therapeutic interventions for osteoporosis have been demonstrated to reduce fractures. Adequate calcium and vitamin D appear to prevent fractures. Alendronate and risedronate 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 treatment 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.

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 organizations, recommended bone mineral density testing 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 individualized approach to screening, stating evidence for universal osteoporosis screening is inconclusive.[11] The American Association of Clinical Endocrinologists 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]

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CLINICAL COMMENTARY

The value of screening for osteoporosis is a much bigger issue for clinicians since the publication 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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REFERENCES

1. Siris ES, Miller PD, Barrett-Connor E, et al. Identification and fracture outcomes of undiagnosed low bone mineral density in postmenopausal women: results from the National Osteoporosis Risk Assessment. *JAMA* 2001; 286:2815–2822.
2. Cooper C, Atkinson EJ, Jacobsen SJ, O'Fallon WM, Melton LJ 3rd. Population-based study of survival after osteoporotic fractures. *Am J Epidemiol* 1993; 137:1001–1005.
3. Cummings SR, Nevitt MC, Browner WS, et al. Risk factors for hip fracture in white women. Study of Osteoporotic Fractures Research Group. *N Engl J Med* 1995; 332:767–773.
4. Cadarette SM, Jaglal SB, Kreiger N, McIsaac WJ, Darlington GA, Tu JV. Development and validation of the Osteoporosis Risk Assessment Instrument to facilitate selection of women for bone densitometry. *CMAJ* 2000; 162:1289–1294.
5. Cadarette SM, Jaglal SB, Murray TM, McIsaac WJ, Joseph L, Brown JP. Evaluation of decision rules for referring women for bone densitometry by dual-energy x-ray absorptiometry. *JAMA* 2001: 286:57–63.
6. Marshall D, Johnell O, Wedel H. Meta-analysis of how well measures of bone marrow density predict occurrence of osteoporotic fractures. *BMJ* 1996; 312:1254–1259.
7. Cranney A, Tugwell P, Adachi J, et al. Meta-analyses of therapies for postmenopausal osteoporosis. III. Meta-analysis of risedronate for the treatment of postmenopausal osteoporosis. *Endocr Rev* 2002; 23:517–523.
8. Cummings SR, Black DM, Thompson DE, et al. Effect of alendronate on risk of fracture in women with low bone density but without vertebral fractures: results from the Fracture Intervention Trial. *JAMA* 1998; 280:2077–2082.
9. Nelson HD, Helfand M, Woolf SH, Allan JD. Screening for postmenopausal osteoporosis: a review of the evidence for the U.S. Preventive Services Task Force. *Ann Intern Med* 2002; 137:529–541.
10. *Physicians Guide to Prevention and Treatment of Osteoporosis.* National Osteoporosis Foundation. Washington, DC: National Osteoporosis Foundation; 1999. Available at: www.nof.org/physguide. Accessed on February 24, 2003.
11. Osteoporosis prevention, diagnosis, and therapy. *NIH Consensus Statement.* 2000; 17:1–45. Available at: http://odp.od.nih.gov/consensus/cons/111/111_statement.htm. Accessed on February 24, 2003.
12. American Association of Clinical Endocrinologists. *2001 Medical Guidelines for Clinical Practice for the Prevention and Management of Postmenopausal Osteoporosis.* Available at: www.aace.com/clin/guidelines/osteoporosis2001.pdf. Accessed on February 24, 2003.