Complete Summary

GUIDELINE TITLE

Screening for osteoporosis in men: a clinical practice guideline from the American College of Physicians.

BIBLIOGRAPHIC SOURCE(S)

Qaseem A, Snow V, Shekelle P, Hopkins R Jr, Forciea MA, Owens DK, Clinical Efficacy Assessment Subcommittee of the American College of Physicians. Screening for osteoporosis in men: a clinical practice guideline from the American College of Physicians. Ann Intern Med 2008 May 6;148(9):680-4. [49 references] PubMed

GUIDELINE STATUS

This is the current release of the guideline.

COMPLETE SUMMARY CONTENT

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SCOPE

DISEASE/CONDITION(S)

Osteoporosis

GUIDELINE CATEGORY

Diagnosis
Evaluation
Risk Assessment
Screening

CLINICAL SPECIALTY

Family Practice
Geriatrics
Internal Medicine
Orthopedic Surgery
Preventive Medicine

INTENDED USERS

Advanced Practice Nurses
Allied Health Personnel
Health Care Providers
Nurses
Physician Assistants
Physicians

GUIDELINE OBJECTIVE(S)

The objective of this guideline is to synthesize the evidence for the following questions:

1. What are the risk factors for osteoporosis in men?
2. Are there any validated tools (other than central bone mineral density [BMD]) to screen for osteoporosis in men?
3. What are the risk factors for low BMD–mediated fracture?

TARGET POPULATION

Adult men older than age 50 years

INTERVENTIONS AND PRACTICES CONSIDERED

1. Assessment of risk factors for osteoporosis in older men
2. Use of dual-energy x-ray absorptiometry (DXA) for men at increased risk for osteoporosis
3. Further research to evaluate osteoporosis screening tests in men

MAJOR OUTCOMES CONSIDERED

- Loss of bone mineral density (BMD)
- Osteoporotic fracture

METHODOLOGY

METHODS USED TO COLLECT/SELECT EVIDENCE

Hand-searches of Published Literature (Primary Sources)
Hand-searches of Published Literature (Secondary Sources)
Searches of Electronic Databases

DESCRIPTION OF METHODS USED TO COLLECT/SELECT THE EVIDENCE

The literature search included studies from MEDLINE from 1990 to July 2007. In addition, the authors did reference mining of retrieved articles, references of previous reviews, and solicited articles from experts. To be included in the review, a study had to measure risk factors for low bone mineral density (BMD) or osteoporotic fracture in men or compare a non-dual-energy x-ray absorptiometry index screening test with a gold standard reference test in men (dual-energy x-ray absorptiometry [DXA or, for calcaneal ultrasonography, fracture occurrence]. Eligible risk factors were judged to be mediated through low BMD on the basis of published literature or expert opinion. Eligible study designs included controlled clinical trials, cohort studies and case series, case-control studies, and systematic reviews or meta-analyses. The authors excluded case reports, non-systematic reviews, letters to the editor, and other similar publications. Four trained researchers (working in pairs) reviewed the list of titles and selected articles for further review. The researchers reviewed each retrieved article with a brief screening form that collected data on demographic characteristics, study design, and clinical outcomes.

NUMBER OF SOURCE DOCUMENTS

This guideline is based on an evaluation of 389 articles, of which 176 addressed risk factors for osteoporosis and 27 addressed diagnostic tools for osteoporosis. (See the study flow diagram in the systematic review listed in the "Availability of Companion Documents" field.)

METHODS USED TO ASSESS THE QUALITY AND STRENGTH OF THE EVIDENCE

Weighting According to a Rating Scheme (Scheme Given)

RATING SCHEME FOR THE STRENGTH OF THE EVIDENCE

This guideline grades the evidence and recommendations by using the American College of Physicians' clinical practice guidelines grading system adopted from the classification developed by the Grading of Recommendations, Assessment, Development, and Evaluation (GRADE) workgroup (see "Rating Scheme for the Strength of the Recommendations" field, below). In addition, to assess the internal validity of diagnostic studies, the authors used the Quality Assessment of Diagnostic Accuracy Studies (QUADAS) evaluation tool. The QUADAS tool is a 14-item questionnaire that evaluates the bias, data variability, and quality of reporting in diagnostic accuracy studies.

METHODS USED TO ANALYZE THE EVIDENCE

Review of Published Meta-Analyses
Systematic Review with Evidence Tables

DESCRIPTION OF THE METHODS USED TO ANALYZE THE EVIDENCE

Data Abstraction

Two physicians independently abstracted data and resolved differences by repeated review. For studies evaluating the performance of osteoporosis screening tests, a statistician extracted sensitivity, specificity, and the standard errors (SEs) at the relevant quantitative ultrasonography or questionnaire threshold. The authors calculated the SEs of sensitivity and specificity for studies that did not report them. If the sensitivity or specificity was not reported in a study and if they could not be calculated from the given data, the authors excluded the study from quantitative analysis. The original authors of some studies were contacted to obtain the sample sizes per group needed to perform this calculation.

Quality Assessment

To evaluate the quality of the included diagnostic studies, the authors evaluated for potential sources of bias. The author's quality appraisal included components from the Quality Assessment of Diagnostic Accuracy Studies (QUADAS) evaluation tool and additional quality variables noted as important in other published studies. The QUADAS tool is a 14-item questionnaire that evaluates the bias, data variability, and quality of reporting in diagnostic accuracy studies.

Data Synthesis

For studies of risk factors for low bone mineral density (BMD)–mediated osteoporotic fracture, the authors identified a meta-analysis and summarized the results. The authors assessed the study by using the Overview Quality Assessment Questionnaire and judged it to be of sufficiently high quality and acceptable to use the results. The authors summarized studies published after this meta-analysis and presented them narratively. For studies of non-dual-energy x-ray (DXA) absorptiometry index screening test that met inclusion criteria and were clinically appropriate, the authors reviewed test thresholds for determining osteoporosis across studies to see whether they were comparable and evaluate whether statistical pooling was appropriate. This analysis revealed these studies to be too heterogeneous for statistical pooling. Therefore, where data were available, the authors abstracted information on the sensitivity and specificity of the screening tests and graphed the data points of studies evaluating the same screening method on receiver-operating characteristic (ROC) curves.

METHODS USED TO FORMULATE THE RECOMMENDATIONS

Expert Consensus
Informal Consensus

DESCRIPTION OF METHODS USED TO FORMULATE THE RECOMMENDATIONS

Guideline developers systematically reviewed the literature to address the questions stated above.

RATING SCHEME FOR THE STRENGTH OF THE RECOMMENDATIONS

The American College of Physicians' Guideline Grading System*		
Quality of Evidence	**Strength of Recommendation**	
	Benefits Clearly Outweigh Risks and Burden OR Risks and Burden Clearly Outweigh Benefits	**Benefits Finely Balanced with Risks and Burden**
High	Strong	Weak
Moderate	Strong	Weak
Low	Strong	Weak
Insufficient evidence to determine net benefits or risks	I-recommendation	

* Adopted from the classification developed by the Grading of Recommendations, Assessment, Development, and Evaluation (GRADE) workgroup.

COST ANALYSIS

A published cost analysis was reviewed.

METHOD OF GUIDELINE VALIDATION

External Peer Review
Internal Peer Review

DESCRIPTION OF METHOD OF GUIDELINE VALIDATION

This guideline was approved by the American College of Physicians Board of Regents on January 13, 2008.

RECOMMENDATIONS

MAJOR RECOMMENDATIONS

The strength of evidence (**High, Moderate, Low**) and the strength of the recommendations (**Strong or Weak**) are defined at the end of the "Major Recommendations" field.

Recommendation 1: *The American College of Physicians recommends that clinicians should periodically perform individualized assessment of risk factors for osteoporosis in older men*. **(Grade: strong recommendation, moderate-quality evidence.)**

The appropriate age to start risk assessment is uncertain. However, by age 65 years, at least 6% of men have dual-energy x-ray absorptiometry (DXA)-determined osteoporosis, therefore, assessment of risk factors before this age is reasonable. Factors that increase the risk for osteoporosis in men include age (>70 years), low body weight (body mass index <20 to 25 kg/m^2), weight loss (>10% [compared with the usual young or adult weight or weight loss in recent years]), physical inactivity (participates in no physical activities on a regular basis [walking, climbing stairs, carrying weights, housework, or gardening]), corticosteroid use, androgen deprivation therapy, and previous fragility fracture. Risk assessments should be updated periodically for men who choose not to be screened.

Recommendation 2: *The American College of Physicians recommends that clinicians should obtain DXA for men who are at increased risk for osteoporosis and are candidates for drug therapy*. **(Grade: strong recommendation, moderate-quality evidence.)**

Bone density measurement with DXA is the accepted reference standard for diagnosing osteoporosis in men. Men who are at increased risk for osteoporosis are candidates for DXA. Little evidence about alternatives to DXA exists. The two most studied methods are quantitative ultrasonography (usually of the calcaneus) and the osteoporosis self-assessment screening tool (OST). Available evidence indicates that neither alternative is sufficiently sensitive or specific at predicting DXA-determined bone mass to be recommended as a substitute for DXA.

No studies have evaluated the optimal intervals for repeated screening by using bone mineral density (BMD) measurement with DXA.

The evidence review showed that calcaneal ultrasonography predicts DXA-determined osteoporosis only modestly well. However, more important, it was a strong predictor of fracture in men. This may be because ultrasonography identifies other bone properties, such as bone quality, which may not be identified on DXA. Because treatment trials have not measured the effectiveness of therapy for osteoporosis diagnosed by ultrasonography rather than DXA, the role of ultrasonography in diagnosis remains uncertain.

Recommendation 3: *The American College of Physicians recommends further research is needed to evaluate osteoporosis screening tests in men.*

A major limitation of existing osteoporosis screening studies is the use of BMD measurement (DXA) as the primary outcome rather than fracture occurrence. Although there is a large body of evidence about risk factors for osteoporosis in women, more research is needed to understand whether these risk factors also

apply to men. Therapy should be evaluated in terms of fracture occurrence because of the significant disability, morbidity, mortality, and expenses that are associated with osteoporotic fractures. Furthermore, the harms of screening in this age group, such as radiation exposure and false-positive results, should also be studied. In addition, more research is needed in evaluating other screening tests, such as quantitative computed tomography, other types of questionnaires, or peripheral BMD measurements, which might also be useful as screening tests in men. Further research should explore whether acceptable substitutes for DXA exist (in terms of establishing the need for pharmacologic therapy). Research that explores the age at which men should begin to consider screening for osteoporosis and effective prevention measures for osteoporosis in men is also needed.

Definitions:

The American College of Physicians' Guideline Grading System*		
Quality of Evidence	**Strength of Recommendation**	
	Benefits Clearly Outweigh Risks and Burden OR Risks and Burden Clearly Outweigh Benefits	**Benefits Finely Balanced with Risks and Burden**
High	Strong	Weak
Moderate	Strong	Weak
Low	Strong	Weak
Insufficient evidence to determine net benefits or risks	I-recommendation	

* Adopted from the classification developed by the Grading of Recommendations, Assessment, Development, and Evaluation (GRADE) workgroup.

CLINICAL ALGORITHM(S)

None provided

EVIDENCE SUPPORTING THE RECOMMENDATIONS

TYPE OF EVIDENCE SUPPORTING THE RECOMMENDATIONS

The type of supporting evidence is identified and graded for each recommendation (see "Major Recommendations").

BENEFITS/HARMS OF IMPLEMENTING THE GUIDELINE RECOMMENDATIONS

POTENTIAL BENEFITS

Appropriate identification and diagnosis of men at risk for osteoporosis

POTENTIAL HARMS

Adverse effects associated with screening

QUALIFYING STATEMENTS

QUALIFYING STATEMENTS

The authors of this article are responsible for its contents, including any clinical or treatment recommendations. No statement in this article should be construed as an official position of the Agency for Healthcare Research and Quality or the U.S. Department of Health and Human Services.

IMPLEMENTATION OF THE GUIDELINE

DESCRIPTION OF IMPLEMENTATION STRATEGY

An implementation strategy was not provided.

IMPLEMENTATION TOOLS

Patient Resources
Staff Training/Competency Material

For information about availability, see the "Availability of Companion Documents" and "Patient Resources" fields below.

INSTITUTE OF MEDICINE (IOM) NATIONAL HEALTHCARE QUALITY REPORT CATEGORIES

IOM CARE NEED

Staying Healthy

IOM DOMAIN

Effectiveness
Patient-centeredness

IDENTIFYING INFORMATION AND AVAILABILITY

BIBLIOGRAPHIC SOURCE(S)

Qaseem A, Snow V, Shekelle P, Hopkins R Jr, Forciea MA, Owens DK, Clinical Efficacy Assessment Subcommittee of the American College of Physicians. Screening for osteoporosis in men: a clinical practice guideline from the American College of Physicians. Ann Intern Med 2008 May 6;148(9):680-4. [49 references] PubMed

ADAPTATION

Not applicable: The guideline was not adapted from another source.

DATE RELEASED

2008 May

GUIDELINE DEVELOPER(S)

American College of Physicians - Medical Specialty Society

SOURCE(S) OF FUNDING

American College of Physicians

GUIDELINE COMMITTEE

Clinical Efficacy Assessment Subcommittee of the American College of Physicians

COMPOSITION OF GROUP THAT AUTHORED THE GUIDELINE

Authors: Amir Qaseem, MD, PhD, MHA; Vincenza Snow, MD; Paul Shekelle, MD, PhD; Robert Hopkins, Jr., MD; Mary Ann Forciea, MD; Douglas K. Owens, MD, MS

Subcommittee Members: Douglas K. Owens, MD, MS (*Chair*); Donald E. Casey Jr., MD, MPH, MBA; Paul Dallas, MD; Thomas D. Denberg, MD, PhD; Mary Ann Forciea, MD; Lakshmi Halasyamani, MD; Robert H. Hopkins Jr., MD; William Rodriguez-Cintron, MD; and Paul Shekelle, MD, PhD

FINANCIAL DISCLOSURES/CONFLICTS OF INTEREST

Grants received: V. Snow (Centers for Disease Control and Prevention, Atlantic Philanthropies, United Health Foundation, Bristol-Myers Squibb, Novo Nordisk, Endopharm, Boehringer Ingelheim, Sanofi Pasteur). Any conflict of interest of the Guideline Development Committee group members was declared, discussed, and resolved.

GUIDELINE STATUS

This is the current release of the guideline.

GUIDELINE AVAILABILITY

Electronic copies: Available from the Annals of Internal Medicine Web site.

Print copies: Available from the American College of Physicians (ACP), 190 N. Independence Mall West, Philadelphia PA 19106-1572.

AVAILABILITY OF COMPANION DOCUMENTS

The followings are available:

- Hau Liu, MD, MBA, MPH; Neil M. Paige, MD, MSHS; Caroline L. Goldzweig, MD, MSHS; Elaine Wong, MD; Annie Zhou, MS; Marika J. Suttorp, MS; Brett Munjas, BA; Eric Orwoll, MD; and Paul Shekelle, MD, PhD. Screening for osteoporosis in men: a systematic review for an American College of Physicians Guideline. Ann Intern Med. 2008 May 6;148:685-701. Electronic copies: Available from the Annals of Internal Medicine Web site.
- Continuing Medical Education (CME) questions from the American College of Physician's (ACP's) Medical Knowledge Self-Assessment Program (MKSAP). Available from the Annals of Internal Medicine Web site.

Print copies: Available from the American College of Physicians (ACP), 190 N. Independence Mall West, Philadelphia PA 19106-1572.

PATIENT RESOURCES

The following is available:

- Summaries for patients. Screening for osteoporosis in men: recommendations from the American College of Physicians. Ann Intern Med 2008 May 6; 148:I-35. Available from the Annals of Internal Medicine Web site.

Print copies: Available from the American College of Physicians (ACP), 190 N. Independence Mall West, Philadelphia PA 19106-1572.

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NGC STATUS

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