



## Complete Summary

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### GUIDELINE TITLE

Screening for coronary heart disease: recommendation statement.

### BIBLIOGRAPHIC SOURCE(S)

Screening for coronary heart disease: recommendation statement. Ann Intern Med 2004 Apr 6;140(7):569-72. [PubMed](#)

### GUIDELINE STATUS

This is the current release of the guideline.

This release updates a previously published guideline: U.S. Preventive Services Task Force. Chapter 1. Screening for asymptomatic coronary artery disease. In: Guide to clinical preventive services. 2nd ed. Baltimore (MD): Williams & Wilkins; 1996. p 3-14.

## COMPLETE SUMMARY CONTENT

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## SCOPE

### DISEASE/CONDITION(S)

- Coronary heart disease (CHD)
- Coronary artery disease (CAD)

### GUIDELINE CATEGORY

Prevention  
Screening

### CLINICAL SPECIALTY

Cardiology  
Family Practice  
Internal Medicine  
Preventive Medicine

## **INTENDED USERS**

Advanced Practice Nurses  
Allied Health Personnel  
Nurses  
Physician Assistants  
Physicians

## **GUIDELINE OBJECTIVE(S)**

- To summarize the current U.S. Preventive Services Task Force (USPSTF) recommendations on screening for coronary heart disease and the supporting evidence
- To update the 1996 recommendations contained in the *Guide to Clinical Preventive Services*, Second Edition

## **TARGET POPULATION**

Asymptomatic adults seen in primary care settings

## **INTERVENTIONS AND PRACTICES CONSIDERED**

Screening for coronary artery disease using medical history, physical examination and cardiac screening tests, including resting electrocardiogram, exercise treadmill testing or electron beam computerized tomography

## **MAJOR OUTCOMES CONSIDERED**

- **Key Question No. 1:** Does testing for asymptomatic coronary artery disease (CAD) with electrocardiography (ECG), exercise electrocardiography treadmill testing (ETT), or electron beam computerized tomography (EBCT) lead to improvement in coronary heart disease (CHD) health outcomes?
- **Key Question No. 2:** Does testing for asymptomatic CAD with ECG, ETT, or EBCT lead to increased use of CHD risk-reducing treatments?
- **Key Question No. 3:** Do any of the screening tests for asymptomatic CAD (ECG, ETT, or EBCT) provide additional prognostic information over and above that from the traditional risk factors?

## **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**

**Note from the National Guideline Clearinghouse (NGC):** A systematic evidence review was prepared by RTI International-University of North Carolina Evidence-based Practice Center (EPC) for the Agency for Healthcare Research and Quality (AHRQ) for use by the U.S. Preventive Services Task Force (USPSTF) (see the "Companion Documents" field).

### **Screening for Asymptomatic Coronary Artery Disease**

#### *Search Strategy*

To identify the relevant literature, a MEDLINE search was conducted for years 1966 through June 2002. The following MeSH headings and keywords were used: (coronary disease and asymptomatic) or (myocardial Infarction and silent) and (electrocardiography or exercise test or tomography, x-ray computed or echocardiography) and (diagnosis or prognosis), limited to English language and human subjects. In addition to these general searches, MEDLINE was searched for articles on several specific electrocardiographic findings, including left ventricular hypertrophy, ventricular arrhythmias, and ST segment changes or T wave inversions. Hand searches of the bibliographies of key articles were also performed, and other recent systematic reviews were used, when available, to supplement the literature searches.

#### *Inclusion Criteria*

Two reviewers examined the abstracts of the articles identified in the initial MEDLINE search and resolved disagreements about inclusion by consensus. Two reviewers examined the full text of the remaining articles to determine final eligibility. To be eligible, studies had to be performed in patients with no previous history of cardiovascular disease and to report the independent effect of the test on the incidence of CHD events, the proportion of patients receiving CHD risk-reducing treatments, or the risk of future CHD events. When reporting the prognostic benefit of electrocardiography (ECG), exercise electrocardiography treadmill testing (ETT) and electron beam computerized tomography (EBCT), studies have used different means of characterizing results. Many studies have reported the outcomes in terms of independent relative risk associated with a positive (versus a negative) screening test. Others have used diagnostic test terminology, such as sensitivity and specificity or positive predictive value. In such cases, the terms are used to indicate test accuracy over the entire follow-up period, rather than at one point in time (e.g. sensitivity is the proportion of all patients who go on to have a CHD event that had positive screening tests at baseline; positive predictive value is the proportion of all patients screening positive that go on to have a CHD event).

### **Exercise Tolerance Testing to Screen for Coronary Heart Disease**

#### *Search Strategy*

To identify the relevant literature, a MEDLINE search was conducted for years 1966 through February 2003. The following exploded MeSH headings were used:

coronary heart disease, exercise test, mass screening, and the keywords "asymptomatic" and "screening," limited to English language and human subjects. To supplement the literature searches, hand searches were performed of the bibliographies of key articles. Other recent systematic reviews were also used, when available. References provided by expert reviewers that had not been identified by other mechanisms, were included, as well.

### *Inclusion Criteria*

Two reviewers examined the abstracts of the articles identified in the initial MEDLINE search and selected a subset for full text review. The same reviewers examined the full text of the selected articles to determine final eligibility. One reviewer extracted information from eligible articles into evidence tables; a second reviewer checked the tables. They resolved disagreements by consensus.

To be eligible, studies for inclusion had to be performed in participants with no previous history of cardiovascular disease or to provide subset analysis for this group. Included studies concerning the detection of severe coronary artery obstruction reported the total number of persons screened, to obtain the sample of persons with an abnormal exercise tolerance testing and the proportion that were found to have CHD on angiography. The yield of exercise tolerance testing screening was determined by dividing the number of participants found to have abnormal angiography by the total number screened.

For the prognostic benefit of exercise tolerance testing, included studies reported the independent value of the test for predicting the incidence of CHD events. Studies that did not use statistical methodology to control for the effect of other risk factors (e.g., age, systolic blood pressure) on the estimate of the prognostic strength of a positive exercise tolerance testing were not included. Excluded studies are recorded in a separate table. Studies used different means of characterizing the prognostic benefit of screening exercise tolerance testing. Many studies reported outcomes in terms of independent relative risk associated with a positive (versus a negative) screening test. Others used diagnostic test terminology, such as sensitivity and specificity or positive predictive value. In such cases, the terms are used to indicate test accuracy over the entire follow-up period rather than at 1 point in time. For example, sensitivity is defined as: of all patients who go on to have a CHD event, the proportion who had tested positive on exercise tolerance testing; positive predictive value is defined as: of all patients who had a positive screening test, the proportion that went on to have a CHD event.

## **NUMBER OF SOURCE DOCUMENTS**

### **Screening for Asymptomatic Coronary Artery Disease**

No studies were retrieved that examined the effect of screening asymptomatic patients with electrocardiography (ECG), exercise electrocardiography treadmill testing (ETT), or electron beam computerized tomography (EBCT) on coronary heart disease (CHD) outcomes.

Two fair quality studies examined the effect of a positive EBCT on self-reported adoption of risk-reducing behaviors and found mixed results.

## **Exercise Tolerance Testing to Screen for Coronary Heart Disease**

A total of 713 articles were identified for review from the literature search. After reviewing the abstracts, 55 articles were retained that examined the diagnostic or prognostic significance of screening exercise tolerance testing. After full article review, 31 articles were kept, representing 29 studies that met the inclusion criterion. Another 11 articles were included through a review of reference lists and input of expert reviewers.

Three good quality studies were identified that estimated the cost effectiveness of exercise tolerance testing for the identification of asymptomatic severe prevalent CHD.

### **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**

The U.S. Preventive Services Task Force grades the **quality of the overall evidence** for a service on a 3-point scale (good, fair, poor):

##### **Good**

Evidence includes consistent results from well-designed, well-conducted studies in representative populations that directly assess effects on health outcomes.

##### **Fair**

Evidence is sufficient to determine effects on health outcomes, but the strength of the evidence is limited by the number, quality, or consistency of the individual studies, generalizability to routine practice, or indirect nature of the evidence on health outcomes.

##### **Poor**

Evidence is insufficient to assess the effects on health outcomes because of limited number or power of studies, important flaws in their design or conduct, gaps in the chain of evidence, or lack of information on important health outcomes.

### **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**

**Note from the National Guideline Clearinghouse (NGC):** A systematic evidence review was prepared by RTI International-University of North Carolina Evidence-based Practice Center (EPC) for the Agency for Healthcare Research and Quality (AHRQ) for use by the U.S. Preventive Services Task Force (USPSTF) (see the "Companion Documents" field).

### **Screening for Asymptomatic Coronary Artery Disease**

Quality of the included articles was rated according to criteria developed by the U.S. Preventive Services Task Force (USPSTF) Methods Work Group. The final set of eligible articles was used to create evidence tables and a draft report.

### **Exercise Tolerance Testing to Screen for Coronary Heart Disease**

EPC staff rated the quality of the included articles according to criteria developed by the USPSTF Methods Work Group. Two tables were constructed containing only studies judged "good". Another table considered several factors which affect quality, chiefly the percentage of patients with a positive exercise tolerance testing who underwent catheterization and how completely the study assessed outcomes. The final set of eligible articles were used to create evidence tables and produce the larger evidence report, which also included evaluation of rest electrocardiography and electron beam computed tomography scan for coronary calcium.

To assess whether there was a relationship between sensitivity of exercise tolerance testing for future coronary heart disease and the length of follow-up time, the correlation between reported sensitivity and mean follow up time, using STATA 7.0 statistical software, was examined.

## **METHODS USED TO FORMULATE THE RECOMMENDATIONS**

Balance Sheets  
Expert Consensus

## **DESCRIPTION OF METHODS USED TO FORMULATE THE RECOMMENDATIONS**

When the overall quality of the evidence is judged to be good or fair, the U.S. Preventive Services Task Force (USPSTF) proceeds to consider the magnitude of net benefit to be expected from implementation of the preventive service. Determining net benefit requires assessing both the magnitude of benefits and the magnitude of harms and weighing the two.

The USPSTF classifies benefits, harms, and net benefits on a 4-point scale: "substantial," "moderate," "small," and "zero/negative."

"Outcomes tables" (similar to 'balance sheets') are the USPSTF's standard resource for estimating the magnitude of benefit. These tables, prepared by the topic teams for use at USPSTF meetings, compare the condition specific outcomes expected for a hypothetical primary care population with and without use of the preventive service. These comparisons may be extended to consider only people

of specified age or risk groups or other aspects of implementation. Thus, outcomes tables allow the USPSTF to examine directly how the preventive services affects benefits for various groups.

When evidence on harms is available, the topic teams assess its quality in a manner like that for benefits and include adverse events in the outcomes tables. When few harms data are available, the USPSTF does not assume that harms are small or nonexistent. It recognizes a responsibility to consider which harms are likely and judge their potential frequency and the severity that might ensue from implementing the service. It uses whatever evidence exists to construct a general confidence interval on the 4-point scale (e.g., substantial, moderate, small, and zero/negative).

Value judgments are involved in using the information in an outcomes table to rate either benefits or harms on the USPSTF's 4-point scale. Value judgments are also needed to weigh benefits against harms to arrive a rating of net benefit.

In making its determinations of net benefit, the USPSTF strives to consider what it believes are the general values of most people. It does this with greater confidence for certain outcomes (e.g., death) about which there is little disagreement about undesirability, but it recognizes that the degree of risk people are willing to accept to avert other outcomes (e.g., cataracts) can vary considerably. When the USPSTF perceives that preferences among individuals vary greatly, and that these variations are sufficient to make trade-off of benefits and harms a 'close-call', then it will often assign a C recommendation (see the "Recommendation Rating Scheme" field). This recommendation indicates the decision is likely to be sensitive to individual patient preferences.

The USPSTF uses its assessment of the evidence and magnitude of net benefit to make recommendations. The general principles the USPSTF follows in making recommendations are outlined in Table 5 of the companion document cited below. The USPSTF liaisons on the topic team compose the first drafts of the recommendations and rationale statements, which the full panel then reviews and edits. Recommendations are based on formal voting procedures that include explicit rules for determining the views of the majority.

From: Harris RP, Helfand M, Woolf SH, Lohr KN, Mulrow, CD, Teutsch SM, Atkins D. Current methods of the U.S. Preventive Services Task Force: a review of the process. Methods Work Group, Third U.S. Preventive Services Task Force. Am J Prev Med 2001 Apr;20(3S):21-35.

## **RATING SCHEME FOR THE STRENGTH OF THE RECOMMENDATIONS**

The USPSTF grades its **recommendations** according to one of 5 classifications (A, B, C, D, I) reflecting the strength of evidence and magnitude of net benefit (benefits minus harms):

### **A**

The USPSTF strongly recommends that clinicians provide [the service] to eligible patients. The USPSTF found good evidence that [the service] improves important health outcomes and concludes that benefits substantially outweigh harms.

## **B**

The USPSTF recommends that clinicians provide [this service] to eligible patients. The USPSTF found at least fair evidence that [the service] improves important health outcomes and concludes that benefits outweigh harms.

## **C**

The USPSTF makes no recommendation for or against routine provision of [the service]. The USPSTF found at least fair evidence that [the service] can improve health outcomes but concludes that the balance of benefits and harms is too close to justify a general recommendation.

## **D**

The USPSTF recommends against routinely providing [the service] to asymptomatic patients. The USPSTF found at least fair evidence that [the service] is ineffective or that harms outweigh benefits.

## **I**

The USPSTF concludes that the evidence is insufficient to recommend for or against routinely providing [the service]. Evidence that the [service] is effective is lacking, of poor quality, or conflicting and the balance of benefits and harms cannot be determined.

## **COST ANALYSIS**

Three studies have attempted to estimate the cost-effectiveness of screening to identify prevalent coronary artery obstruction. In 1989, a decision analysis model was used to estimate the clinical effectiveness and cost-effectiveness of exercise testing in asymptomatic adults. The model was structured so that the benefit of screening was achieved through detection of patients with severe disease who would benefit from revascularization. Only direct costs were considered. Levels were based on reimbursement rates at the time of the study (late 1980's): exercise test (\$165), angiography (\$3595), and coronary artery bypass surgery (\$31,178). No discounting rate was given. It was found that screening 60 year-old men had a cost per life-year saved of \$24,600; for women, the cost was \$47,606. For persons 40 years of age, the cost-effectiveness ratios were much higher: \$80,349 per life year saved for men and \$216,496 per life year saved for women.

The presence or absence of CHD risk factors affected the cost-effectiveness ratios. For 60-year-old men with no risk factors, the cost per life year saved was \$44,332; for men with one or more CHD risk factors, it was \$20,504. The authors concluded that routine screening was not warranted in general but that it may be beneficial for persons at increased risk for CHD (e.g., older men with 1 or more

risk factors). An earlier cost-effectiveness analysis of screening exercise tolerance testing reached similar findings.

A group of researchers conducted a cost analysis of data from their study of the clinical yield of screening exercise tolerance testing to detect unsuspected severe coronary artery obstruction. They sampled more than 4,000 persons referred to the Cleveland Clinic for screening exercise tolerance testing. Cost data came from 1994 Medicare reimbursement rates: \$110 for exercise testing, \$1780 for angiography, and 27,270 for coronary artery bypass surgery. Screening identified 19 cases of patients with severe coronary artery obstruction (0.44% of the cohort), of these, 14 had subsequent bypass surgery. The authors estimated a cost of \$39,623 to identify 1 case of severe CAD by screening exercise tolerance testing. The estimated cost per year of life saved was \$55,274.

Based on these studies, it appears that screening with exercise treadmill testing and performing bypass surgery on those with severe obstructions is relatively cost-effective compared with other, better accepted types of preventive care, such as mammography in women ages 50-69.

From: Pignone M, Fowler-Brown A, Pletcher M, Tice JA. Screening for Asymptomatic Coronary Artery Disease. Rockville (MD); Agency for Healthcare Research and Quality; 2004 Feb. (Systematic Evidence Review No. 22).

## **METHOD OF GUIDELINE VALIDATION**

Comparison with Guidelines from Other Groups  
External Peer Review  
Internal Peer Review

## **DESCRIPTION OF METHOD OF GUIDELINE VALIDATION**

Peer Review: Before the U.S. Preventive Services Task Force (USPSTF) makes its final determination about recommendations on a given preventive service, the Evidence-based Practice Center and the Agency for Healthcare Research and Quality send a draft systematic evidence review to 4 to 6 external experts and to federal agencies and professional and disease-based health organizations with interests in the topic. They ask the experts to examine the review critically for accuracy and completeness, and to respond to a series of specific questions about the document. After assembling these external review comments and documenting the proposed response to key comments, the topic team presents this information to the Task Force in memo form. In this way, the Task Force can consider these external comments and a final version of the systematic review before it votes on its recommendations about the service. Draft recommendations are then circulated for comment from reviewers representing professional societies, voluntary organizations and Federal agencies. These comments are discussed before the whole U.S. Preventive Services Task Force final recommendations are made.

Recommendation of Others: Recommendations for screening for coronary heart disease (CHD) from the following groups were discussed: American Heart Association/American College of Cardiology (AHA/ACC), and American Academy of Family Physicians.

## RECOMMENDATIONS

### MAJOR RECOMMENDATIONS

The U.S. Preventive Services Task Force (USPSTF) grades its recommendations (A, B, C, D, or I) and the quality of the overall evidence for a service (good, fair, poor). The definitions of these grades can be found at the end of the "Major Recommendations" field.

The U.S. Preventive Services Task Force (USPSTF) recommends against routine screening with resting electrocardiogram (ECG), exercise treadmill test (ETT), or electron beam computerized tomography (EBCT) scanning for coronary calcium, for either the presence of severe coronary artery stenosis (CAS) or the prediction of coronary heart disease (CHD) events in adults at low risk for CHD events. **D recommendation.**

*The USPSTF found at least fair evidence that ECG or ETT can detect some asymptomatic adults at increased risk for CHD events independent of conventional CHD risk factors (see Clinical Considerations), and that ETT can detect severe CAS in a small number of asymptomatic adults. Similar evidence for EBCT is limited. In the absence of evidence that such detection by ECG, ETT, or EBCT among adults at low risk for CHD events ultimately results in improved health outcomes, and because false positive tests are likely to cause harm, including unnecessary invasive procedures, over-treatment, and labeling, the USPSTF concluded that the potential harms of routine screening for CHD in this population exceed the potential benefits.*

The USPSTF found insufficient evidence to recommend for or against routine screening with ECG, ETT, or EBCT scanning for coronary calcium, for either the presence of severe CAS or the prediction of CHD events in adults at increased risk for CHD events. **I recommendation.**

*The USPSTF found inadequate evidence to determine the extent to which the added detection offered by ECG, ETT, or EBCT beyond that obtained by ascertainment of conventional CHD risk factors (see Clinical Considerations), would result in interventions that lead to improved CHD-related health outcomes among adults at increased risk for CHD events. Although there is limited evidence to determine the magnitude of harms from screening this population, harms from false positive tests (ie, unnecessary invasive procedures, over-treatment, and labeling) are likely to occur. As a result, the USPSTF could not determine the balance between benefits and harms of screening this population for CHD.*

### Clinical Considerations

- Several factors are associated with a higher risk for CHD events (the major ones are nonfatal myocardial infarction and coronary death), including older age, male gender, high blood pressure, smoking, abnormal lipid levels, diabetes, obesity, and sedentary lifestyle. A person's risk for CHD events can be estimated based on the presence of these factors. Calculators are available to ascertain a person's risk for having a CHD event; for example, a calculator to estimate a person's risk for a CHD event in the next 10 years can be

accessed at <http://hin.nhlbi.nih.gov/atpiii/calculator.asp?usertype=prof>. Although the exact risk factors that constitute each of these categories (low or increased risk) have not been established, younger adults (ie, men <50 and women <60 years) who have no other risk factors for CHD (<5%-10% 10-year risk) are considered to be at low risk. Older adults, or younger adults with 1 or more risk factors (>15%-20% 10-year risk), are considered to be at increased risk.

- Screening with ECG, ETT, and EBCT could potentially reduce CHD events in 2 ways: either by detecting people at high risk for CHD events who could benefit from more aggressive risk factor modification, or by detecting people with existing severe CAS whose life could be prolonged by coronary artery bypass graft (CABG) surgery. However, the evidence is inadequate to determine the extent to which people detected through screening in either situation would benefit from either type of intervention.
- The consequences of false-positive tests may potentially outweigh any the benefits of screening. False-positive tests are common in among asymptomatic adults, especially among women, and may lead to unnecessary diagnostic testing, over-treatment, and labeling.
- Because the sensitivity of these tests is limited, screening could also result in many false-negative results. A negative test does not rule out the presence of severe CAS or a future CHD event.
- For people in certain occupations, such as pilots and heavy equipment operators (for whom sudden incapacitation or sudden death may endanger the safety of others), considerations other than the health benefit to the individual patient may influence the decision to screen for CHD.
- Although some exercise programs initially screen asymptomatic participants with ETT, there is not enough evidence to determine the balance of benefits and harms of this practice.

### **Definitions:**

#### **Strength of Recommendations**

The USPSTF grades its **recommendations** according to one of 5 classifications (A, B, C, D, I) reflecting the strength of evidence and magnitude of net benefit (benefits minus harms):

#### **A**

The USPSTF strongly recommends that clinicians provide [the service] to eligible patients. The USPSTF found good evidence that [the service] improves important health outcomes and concludes that benefits substantially outweigh harms.

#### **B**

The USPSTF recommends that clinicians provide [this service] to eligible patients. The USPSTF found at least fair evidence that [the service] improves important health outcomes and concludes that benefits outweigh harms.

#### **C**

The USPSTF makes no recommendation for or against routine provision of [the service]. The USPSTF found at least fair evidence that [the service] can improve health outcomes but concludes that the balance of benefits and harms is too close to justify a general recommendation.

## **D**

The USPSTF recommends against routinely providing [the service] to asymptomatic patients. The USPSTF found at least fair evidence that [the service] is ineffective or that harms outweigh benefits.

## **I**

The USPSTF concludes that the evidence is insufficient to recommend for or against routinely providing [the service]. Evidence that the [service] is effective is lacking, of poor quality, or conflicting and the balance of benefits and harms cannot be determined.

### **Strength of Evidence**

The USPSTF grades the **quality of the overall evidence** for a service on a 3-point scale (good, fair, poor):

#### **Good**

Evidence includes consistent results from well-designed, well-conducted studies in representative populations that directly assess effects on health outcomes.

#### **Fair**

Evidence is sufficient to determine effects on health outcomes, but the strength of the evidence is limited by the number, quality, or consistency of the individual studies, generalizability to routine practice, or indirect nature of the evidence on health outcomes.

#### **Poor**

Evidence is insufficient to assess the effects on health outcomes because of limited number or power of studies, important flaws in their design or conduct, gaps in the chain of evidence, or lack of information on important health outcomes.

### **CLINICAL ALGORITHM(S)**

None provided

## **EVIDENCE SUPPORTING THE RECOMMENDATIONS**

### **TYPE OF EVIDENCE SUPPORTING THE RECOMMENDATIONS**

The type of evidence supporting the recommendations is identified in the "Major Recommendations" field.

## BENEFITS/HARMS OF IMPLEMENTING THE GUIDELINE RECOMMENDATIONS

### POTENTIAL BENEFITS

Screening with electrocardiogram (ECG), exercise treadmill testing (ETT), and electron beam computed tomography (EBCT) could potentially reduce coronary heart disease (CHD) events in 2 ways: either by detecting people at high risk for CHD events who could benefit from more aggressive risk factor modification, or by detecting people with existing severe coronary artery stenosis (CAS) whose life can be prolonged by coronary artery bypass graft surgery (CABG). However, the evidence is inadequate to determine the extent to which people detected through screening in either situation would benefit from either type of intervention.

#### Subgroups Most Likely to Benefit

- Screening may potentially be of greatest benefit to those presumed to be at intermediate risk for CHD who could be reclassified as being at high risk (and thus treated more aggressively) after additional testing.
- For people in certain occupations, such as pilots and heavy equipment operators (for whom sudden incapacitation or sudden death may endanger the safety of others), considerations other than the health benefit to the individual patient may influence the decision to screen for CHD.

### POTENTIAL HARMS

Potential harms of screening asymptomatic patients for coronary heart disease (CHD) include unnecessary invasive testing (e.g., coronary angiography) and "labeling" of those who have had false-positive test results. In low-risk asymptomatic populations, most positive electrocardiogram (ECG) test results occur in those who will not have a CHD event in the next 5 to 10 years. One study reported that 71% of those without symptoms who had an abnormal exercise treadmill test (ETT) had no angiographically demonstrable coronary artery stenosis (CAS). While the yield of screening is low in those at low risk for CHD, the potential for harm from false-positive tests is high. The U.S. Preventive Services Task Force (USPSTF) judged that the benefits of screening people at low risk for CHD would not outweigh the potential harms.

## QUALIFYING STATEMENTS

### QUALIFYING STATEMENTS

The U.S. Preventive Services Task Force recommendations are independent of the U.S. government. They do not represent the views of the Agency for Healthcare Research and Quality (AHRQ), the U.S. Department of Health and Human Services, or the U.S. Public Health Service.

## IMPLEMENTATION OF THE GUIDELINE

### DESCRIPTION OF IMPLEMENTATION STRATEGY

The experiences of the first and second U.S. Preventive Services Task Force (USPSTF), as well as that of other evidence-based guideline efforts, have highlighted the importance of identifying effective ways to implement clinical recommendations. Practice guidelines are relatively weak tools for changing clinical practice when used in isolation. To effect change, guidelines must be coupled with strategies to improve their acceptance and feasibility. Such strategies include enlisting the support of local opinion leaders, using reminder systems for clinicians and patients, adopting standing orders, and audit and feedback of information to clinicians about their compliance with recommended practice.

In the case of preventive services guidelines, implementation needs to go beyond traditional dissemination and promotion efforts to recognize the added patient and clinician barriers that affect preventive care. These include clinicians' ambivalence about whether preventive medicine is part of their job, the psychological and practical challenges that patients face in changing behaviors, lack of access to health care or of insurance coverage for preventive services for some patients, competing pressures within the context of shorter office visits, and the lack of organized systems in most practices to ensure the delivery of recommended preventive care.

Dissemination strategies have changed dramatically in this age of electronic information. While recognizing the continuing value of journals and other print formats for dissemination, the Agency for Healthcare Research and Quality will make all U.S. Preventive Services Task Force (USPSTF) products available through its [Web site](#). The combination of electronic access and extensive material in the public domain should make it easier for a broad audience of users to access U.S. Preventive Services Task Force materials and adapt them for their local needs. Online access to U.S. Preventive Services Task Force products also opens up new possibilities for the appearance of the annual, pocket-size *Guide to Clinical Preventive Services*.

To be successful, approaches for implementing prevention have to be tailored to the local level and deal with the specific barriers at a given site, typically requiring the redesign of systems of care. Such a systems approach to prevention has had notable success in established staff-model health maintenance organizations, by addressing organization of care, emphasizing a philosophy of prevention, and altering the training and incentives for clinicians. Staff-model plans also benefit from integrated information systems that can track the use of needed services and generate automatic reminders aimed at patients and clinicians, some of the most consistently successful interventions. Information systems remain a major challenge for individual clinicians' offices, however, as well as for looser affiliations of practices in network-model managed care and independent practice associations, where data on patient visits, referrals, and test results are not always centralized.

### IMPLEMENTATION TOOLS

Foreign Language Translations  
Patient Resources  
Personal Digital Assistant (PDA) Downloads  
Pocket Guide/Reference Cards

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

## IDENTIFYING INFORMATION AND AVAILABILITY

### BIBLIOGRAPHIC SOURCE(S)

Screening for coronary heart disease: recommendation statement. Ann Intern Med 2004 Apr 6;140(7):569-72. [PubMed](#)

### ADAPTATION

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

### DATE RELEASED

1996 (revised 2004 Feb 17)

### GUIDELINE DEVELOPER(S)

United States Preventive Services Task Force - Independent Expert Panel

### GUIDELINE DEVELOPER COMMENT

The U.S. Preventive Services Task Force (USPSTF) is a Federally-appointed panel of independent experts. Conclusions of the U.S. Preventive Services Task Force do not necessarily reflect policy of the U.S. Department of Health and Human Services (DHHS) or its agencies.

### SOURCE(S) OF FUNDING

United States Government

## **GUIDELINE COMMITTEE**

U.S. Preventive Services Task Force (USPSTF)

## **COMPOSITION OF GROUP THAT AUTHORED THE GUIDELINE**

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*\*Members of the Task Force at the time this recommendation was finalized. For a list of current Task Force members, go to [www.ahrq.gov/clinic/uspstfab.htm](http://www.ahrq.gov/clinic/uspstfab.htm).*

## **FINANCIAL DISCLOSURES/CONFLICTS OF INTEREST**

The U.S. Preventive Services Task Force has an explicit policy concerning conflict of interest. All members and evidence-based practice center (EPC) staff disclose at each meeting if they have an important financial conflict for each topic being discussed. Task Force members and EPC staff with conflicts can participate in discussions about evidence, but members abstain from voting on recommendations about the topic in question.

From: Harris RP, Helfand M, Woolf SH, Lohr KN, Mulrow, CD, Teutsch SM, Atkins D. Current methods of the U.S. Preventive Services Task Force: a review of the process. Methods Work Group, Third U.S. Preventive Services Task Force. Am J Prev Med 2001 Apr;20(3S):21-35.

## **GUIDELINE STATUS**

This is the current release of the guideline.

This release updates a previously published guideline: U.S. Preventive Services Task Force. Chapter 1. Screening for asymptomatic coronary artery disease. In: Guide to clinical preventive services. 2nd ed. Baltimore (MD): Williams & Wilkins; 1996. p 3-14.

## **GUIDELINE AVAILABILITY**

Electronic copies: Available from the [U.S. Preventive Services Task Force \(USPSTF\) Web site](#). Also available from [Annals of Internal Medicine Online](#).

Print copies: Available from the Agency for Healthcare Research and Quality (AHRQ) Publications Clearinghouse. For more information, go to <http://www.ahrq.gov/news/pubsix.htm> or call 1-800-358-9295 (U.S. only).

## **AVAILABILITY OF COMPANION DOCUMENTS**

The following are available:

Evidence Reviews:

- Fowler-Brown A, Pignone M, Pletcher M, Tice JA, Sutton SF, & Lohr KN. Exercise tolerance testing to screen for coronary heart disease: a systematic review for the technical support for the U.S. Preventive Services Task Force. *Ann Intern Med*, 2004 Feb;140:W9-W24.

Electronic copies: Available from the [U.S. Preventive Services Task Force \(USPSTF\) Web site](#). Also available from [Annals of Internal Medicine Online](#).

- Pignone M, Fowler-Brown A, Pletcher M, Tice JA. Screening for asymptomatic coronary artery disease. Rockville (MD); Agency for Healthcare Research and Quality; 2004 Feb. (Systematic Evidence Review No. 22).

Electronic copies: Available from the [U.S. Preventive Services Task Force \(USPSTF\) Web site](#).

Background Articles:

- Woolf SH, Atkins D. The evolving role of prevention in health care: contributions of the U.S. Preventive Services Task Force. *Am J Prev Med* 2001 Apr;20(3S):13-20.
- Harris RP, Helfand M, Woolf SH, Lohr KN, Mulrow, CD, Teutsch SM, Atkins D. Current methods of the U.S. Preventive Services Task Force: a review of the process. Methods Work Group, Third U.S. Preventive Services Task Force. *Am J Prev Med* 2001 Apr;20(3S):21-35.
- Saha S, Hoerger TJ, Pignone MP, Teutsch SM, Helfand M, Mandelblatt JS. The art and science of incorporating cost effectiveness into evidence-based recommendations for clinical preventive services. Cost Work Group of the Third U.S. Preventive Services Task Force. *Am J Prev Med* 2001 Apr;20(3S):36-43.

Electronic copies: Available from [U.S. Preventive Services Task Force \(USPSTF\) Web site](#).

The following are also available:

- The guide to clinical preventive services, 2006. Recommendations of the U.S. Preventive Services Task Force. Rockville (MD): Agency for Healthcare Research and Quality (AHRQ), 2006. 228 p. Electronic copies available from the [AHRQ Web site](#).
- A step-by-step guide to delivering clinical preventive services: a systems approach. Rockville (MD): Agency for Healthcare Research and Quality (AHRQ), 2002 May. 189 p. Electronic copies available from the [AHRQ Web site](#). See the related QualityTool summary on the [Health Care Innovations Exchange Web site](#).

Print copies: Available from the Agency for Healthcare Research and Quality Publications Clearinghouse. For more information, go to <http://www.ahrq.gov/news/pubsix.htm> or call 1-800-358-9295 (U.S. only).

The [Electronic Preventive Services Selector \(ePSS\)](#), available as a PDA application and a web-based tool, is a quick hands-on tool designed to help primary care clinicians identify the screening, counseling, and preventive medication services that are appropriate for their patients. It is based on current recommendations of the USPSTF and can be searched by specific patient characteristics, such as age, sex, and selected behavioral risk factors.

## **PATIENT RESOURCES**

The following is available:

- The Pocket Guide to Good Health for Adults. Rockville (MD): Agency for Healthcare Research and Quality (AHRQ); 2003.

Electronic copies: Available from the [U.S. Preventive Services Task Force \(USPSTF\) Web site](#). Copies also available in Spanish from the [USPSTF Web site](#). See the related QualityTool summary on the [Health Care Innovations Exchange Web site](#).

- Screening for coronary heart disease: recommendations from the U.S. Preventive Services Task Force. Summary for patients. *Ann Intern Med* 2004 Apr 6;140(7):I-1.

Electronic copies: Available from the [Annals of Internal Medicine Online](#).

Please note: This patient information is intended to provide health professionals with information to share with their patients to help them better understand their health and their diagnosed disorders. By providing access to this patient information, it is not the intention of NGC to provide specific medical advice for particular patients. Rather we urge patients and their representatives to review this material and then to consult with a licensed health professional for evaluation of treatment options suitable for them as well as for diagnosis and answers to their personal medical questions. This patient information has been derived and prepared from a guideline for health care professionals included on NGC by the authors or publishers of that original guideline. The patient information is not reviewed by NGC to establish whether or not it accurately reflects the original guideline's content.

## **NGC STATUS**

This summary was completed by ECRI on June 30, 1998. The information was verified by the guideline developer on December 1, 1998. This summary was updated on ECRI on February 3, 2004.

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