



General

Guideline Title

Screening for glaucoma: U.S. Preventive Services Task Force recommendation statement.

Bibliographic Source(s)

U.S. Preventive Services Task Force. Screening for glaucoma: U.S. Preventive Services Task Force recommendation statement. *Ann Intern Med.* 2013 Oct 1;159(7):484-9. [15 references] [PubMed](#)

Guideline Status

This is the current release of the guideline.

This guideline updates a previously published guideline: U.S. Preventive Services Task Force (USPSTF). Screening for glaucoma: recommendation statement. Rockville (MD): Agency for Healthcare Research and Quality (AHRQ); 2005 Mar. 9 p.

This guideline meets NGC's 2013 (revised) inclusion criteria.

Recommendations

Major Recommendations

The U.S. Preventive Services Task Force (USPSTF) grades its recommendations (A, B, C, D, or I) and identifies the levels of certainty regarding net benefit (High, Moderate, and Low). The definitions of these grades can be found at the end of the "Major Recommendations" field.

The USPSTF concludes that the current evidence is insufficient to assess the balance of benefits and harms of screening for primary open-angle glaucoma (POAG) in adults. (I statement)

Clinical Considerations

Patient Population Under Consideration

This recommendation applies to adults who do not have vision symptoms and are seen in a primary care setting.

Assessment of Risk

Increased intraocular pressure (IOP), family history of glaucoma, older age, and African American race increase a person's risk for open-angle glaucoma. Recent evidence shows that glaucoma may be increased in Hispanics. Older African Americans have a higher prevalence of glaucoma and perhaps a more rapid disease progression; if screening reduces vision impairment, then African Americans would probably have greater absolute benefit than whites.

Screening Tests

Diagnosis of POAG is based on a combination of tests showing characteristic degenerative changes in the optic disc and defects in visual fields (often loss in peripheral vision). Although increased IOP was previously considered an important part of the definition of this condition, it is now known that many persons with POAG do not have increased IOP and not all persons with increased IOP have or will develop glaucoma. Therefore, screening with tonometry alone may be inadequate to detect all cases of POAG.

Measurement of visual fields can be difficult. The reliability of a single measurement may be low; several consistent measurements are needed to establish the presence of defects. Specialists use dilated ophthalmoscopy or slit lamp examination to evaluate changes in the optic disc; however, even experts have varying ability to detect glaucomatous progression of the optic disc. In addition, no single standard exists to define and measure progression of visual field defects. Most tests that are available in a primary care setting do not have acceptable accuracy to detect glaucoma.

Treatment

The initial aim and efficacy assessment of primary treatments of POAG are reduction of IOP. Treatments include medication, laser therapy, and surgery. These treatments also effectively reduce the longer-term development and progression of small visual field defects as assessed by clinical examination. However, the magnitude of the effectiveness in reducing impairments in patient-reported, vision-related function, including development of blindness, is uncertain.

Suggestions for Practice Regarding the I Statement

Potential Preventable Burden

Approximately 2.5 million persons in the United States have glaucoma, and approximately 1.9% of adults older than 40 years have open-angle glaucoma. Most persons with glaucoma have POAG. This condition is defined as optic neuropathy with a visibly open anterior chamber angle (between the iris and the anterior sclera or peripheral cornea) that is associated with progressive death of retinal ganglion cells and axons and visual field loss.

The goal of screening programs is to identify and treat POAG before visual impairment develops. The proportion of persons who are currently unidentified and who will develop vision problems as a result of a diagnosis obtained through screening is not known. The natural history of glaucoma is heterogeneous and poorly defined.

In some persons, POAG does not progress or progression is so slow that it never has an important effect on vision. The size of this subgroup is uncertain and may depend on the ethnicity and age of the population and initial findings of ophthalmologic testing. Screening in asymptomatic persons is likely to increase the size of this subgroup. Other patients have more rapid progression, as determined by optic nerve damage, visual field defects, and development of visual impairment.

Whether early glaucoma will progress to visual impairment cannot be precisely predicted. Whether the rate of progression of visual field defects remains uniform throughout the course of glaucoma is also not known. Older adults and African Americans seem to be at increased risk and have more rapid progression. Persons with a short life expectancy probably have little to gain from glaucoma screening.

Potential Harms

Harms caused by treatment of glaucoma include formation of cataracts and those resulting from surgery and from topical medications. Overdiagnosis and overtreatment are possible because not all persons who are diagnosed with and treated for glaucoma progress to visual impairment; the magnitude of overdiagnosis and overtreatment is unknown.

Costs

The cost of screening varies widely depending on the tests used. Testing with hand-held tonometers and ophthalmoscopes can be done quickly and inexpensively. However, the diagnostic accuracy of these inexpensive tests is not known. According to the National Business Group on Health, the average screening eye examination costs \$71. Screening with specialized tests for glaucoma and with newer computerized instruments is more expensive.

Current Practice

Approximately 62% of Medicare patients enrolled in a health maintenance organization (HMO) were screened for glaucoma in 2009. In 2008, approximately 53% of whites, 47% of African Americans, and 37% of Hispanics reported an annual eye care visit.

Definitions:

What the U.S. Preventive Services Task Force (USPSTF) Grades Mean and Suggestions for Practice

Grade	Grade Definitions	Suggestions for Practice
A	The USPSTF recommends the service. There is high certainty that the net benefit is substantial.	Offer or provide this service.
B	The USPSTF recommends the service. There is high certainty that the net benefit is moderate or there is moderate certainty that the net benefit is moderate to substantial.	Offer or provide this service.
C	The USPSTF recommends selectively offering or providing this service to individual patients based on professional judgment and patient preferences. There is at least moderate certainty that the net benefit is small.	Offer or provide this service only if other considerations support offering or providing the service in an individual patient.
D	The USPSTF recommends against the service. There is moderate or high certainty that the service has no net benefit or that the harms outweigh the benefits.	Discourage the use of this service.
I Statement	The USPSTF concludes that the current evidence is insufficient to assess the balance of benefits and harms of the service. Evidence is lacking, of poor quality, or conflicting, and the balance of benefits and harms cannot be measured.	Read "Clinical Considerations" section of USPSTF Recommendation Statement (see the "Major Recommendations" field). If the service is offered, patients should understand the uncertainty about the balance of benefits and harms.

USPSTF Levels of Certainty Regarding Net Benefit

Definition: The USPSTF defines *certainty* as "likelihood that the USPSTF assessment of the net benefit of a preventive service is correct." The net benefit is defined as benefit minus harm of the preventive service as implemented in a general, primary care population. The USPSTF assigns a certainty level based on the nature of the overall evidence available to assess the net benefit of a preventive service.

Level of Certainty	Description
High	The available evidence usually includes consistent results from well-designed, well-conducted studies in representative primary care populations. These studies assess the effects of the preventive service on health outcomes. This conclusion is therefore unlikely to be strongly affected by the results of future studies.
Moderate	<p>The available evidence is sufficient to determine the effects of the preventive service on health outcomes, but confidence in the estimate is constrained by factors such as:</p> <ul style="list-style-type: none"> • The number, size, or quality of individual studies • Inconsistency of findings across individual studies • Limited generalizability of findings to routine primary care practice; and • Lack of coherence in the chain of evidence <p>As more information becomes available, the magnitude or direction of the observed effect could change, and this change may be large enough to alter the conclusion.</p>
Low	<p>The available evidence is insufficient to assess effects on health outcomes. Evidence is insufficient because of:</p> <ul style="list-style-type: none"> • The limited number or size of studies • Important flaws in study design or methods • Inconsistency of findings across individual studies • Gaps in the chain of evidence • Findings not generalizable to routine primary care practice; and • A lack of information on important health outcomes <p>More information may allow an estimation of effects on health outcomes.</p>

Clinical Algorithm(s)

None provided

Scope

Disease/Condition(s)

Primary open-angle glaucoma (POAG)

Guideline Category

Prevention

Screening

Clinical Specialty

Family Practice

Geriatrics

Ophthalmology

Optometry

Preventive Medicine

Intended Users

Advanced Practice Nurses

Allied Health Personnel

Nurses

Optometrists

Physician Assistants

Physicians

Guideline Objective(s)

- To summarize the U.S. Preventive Services Task Force (USPSTF) recommendations on screening for glaucoma and the supporting scientific evidence
- To update the 2004 recommendations by USPSTF

Target Population

Adults who do not have vision symptoms and are seen in a primary care setting

Interventions and Practices Considered

Screening tests for primary open-angle glaucoma (POAG), including:

- Tonometry
- Visual field measurement

- Dilated ophthalmoscopy
- Slit lamp exam

Major Outcomes Considered

- Key Question 1
 - Key Question 1a: Does a screening-based program for open-angle glaucoma lead to less visual impairment when compared with no screening program?
 - Key Question 1b: How does visual impairment vary when comparing different screening-based programs for open-angle glaucoma?
- Key Question 2
 - Key Question 2a: Does a screening-based program for open-angle glaucoma lead to improvements in patient-reported outcomes when compared to no screening?
 - Key Question 2b: How do patient-reported outcomes vary when comparing different screening-based programs for open-angle glaucoma?
- Key Question 3: What is the predictive value of screening tests for open-angle glaucoma?
- Key Question 4
 - Key Question 4a: Does a screening-based program for open-angle glaucoma lead to reductions in intraocular pressure when compared with no screening program?
 - Key Question 4b: How does intraocular pressure vary when comparing different screening-based programs for open-angle glaucoma?
- Key Question 5
 - Key Question 5a: Does a screening-based program lead to a slowing of the progression of optic nerve damage and visual field loss when compared with no screening program?
 - Key Question 5b: How do optic nerve damage and visual field loss vary when comparing different screening-based programs for open-angle glaucoma?
- Key Question 6: What are the harms associated with screening for open-angle glaucoma?

Methodology

Methods Used to Collect/Select the 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 comparative effectiveness review was prepared by the Johns Hopkins University Evidence-based Practice Center (EPC) for the U.S. Preventive Services Task Force (USPSTF) (see the "Availability of Companion Documents" field).

Search Strategy

EPC staff searched the following databases for primary studies: MEDLINE®, EMBASE, LILACS (Latin American and Caribbean Literature on Health Sciences), and CENTRAL (the Cochrane Central Register of Controlled Trials). They developed a search strategy for MEDLINE, accessed via PubMed, based on an analysis of the medical subject heading (MeSH) terms and text words of key articles identified a priori. They adapted this search strategy for searches of EMBASE (using Emtree terms), CENTRAL, and LILACS. They searched the literature without imposed language, sample size, or date restrictions. They searched relevant systematic reviews to identify any additional studies that should be included. They searched from the beginning of each database through October 6, 2011.

EPC staff also conducted a search in MEDLINE and CENTRAL for systematic reviews that addressed the key questions (KQs) of interest. The

search included the topic strategy (noted in Appendix A of the full report) combined with the term "AND systematic[sb]" and was limited to systematic reviews published from 2009 to 2011. They searched MEDION (www.mediondatabase.nl) for related diagnostic accuracy reviews (KQ3). The search for systematic reviews was conducted on March 2, 2011.

EPC staff screened an existing database of eye and vision systematic reviews prepared by Li (2010) to identify relevant open-angle glaucoma systematic reviews published prior to 2009. Li searched MEDLINE, EMBASE, and CENTRAL from inception to September 2009, and two reviewers screened titles, abstracts, and full-text manuscripts to identify eye and vision systematic reviews.

Abstract Screening

EPC staff developed an abstract screening form. All investigators pilot tested the form using a set of candidate abstracts identified from the electronic searches. They screened potentially relevant citations (primary studies and systematic reviews) via the Web-based systematic review software DistillerSR (<http://systematic-review.net/>). All citations identified by the search strategies were uploaded to DistillerSR. Two reviewers independently assessed titles and abstracts resulting from the literature searches according to the inclusion criteria. We classified the titles and abstracts as "include," "exclude," or "unsure." They resolved disagreements about eligibility through discussion among reviewers. They initially reviewed for inclusion non-English-language articles with English abstracts but decided to exclude all non-English articles, as they were unable to identify appropriate translation services for all non-English abstracts and/or the full text of potentially eligible articles prior to the start of full-text screening.

Full-Text Screening

Two reviewers independently applied the same inclusion criteria used during abstract screening. Citations tagged as "unsure" by both reviewers, "unsure" by one reviewer and "include" by the other, or "include" by both reviewers were promoted to full-text screening. They excluded non-English-language articles from further consideration at this stage. They resolved any disagreements regarding inclusion through discussion between reviewers, or, as needed, among all investigators during a team meeting.

Number of Source Documents

- 2 systematic reviews were included.
- 83 primary studies were included.

Methods Used to Assess the Quality and Strength of the Evidence

Expert Consensus (Committee)

Rating Scheme for the Strength of the Evidence

Not applicable

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 comparative effectiveness review was prepared by the Johns Hopkins University Evidence-based Practice Center (EPC) for the U.S. Preventive Services Task Force (USPSTF) (see the "Availability of Companion Documents" field).

Data Abstraction

Data abstraction forms were designed and pilot tested. One reviewer extracted descriptions of the study, including details about the population,

devices/tests, and outcomes of interest, using the systematic review software DistillerSR. A second reviewer verified the data. They resolved disagreements through discussion.

Risk-of-Bias Assessment

The reviewers used the Cochrane Collaboration's tool for assessing the risk of bias of randomized and quasi-randomized trials. Two reviewers assessed the included studies for sources of systematic bias according to the guidelines in Chapter 8 of the Cochrane Handbook for Systematic Reviews of Interventions and evaluated the studies for the following criteria: sequence generation and allocation concealment (selection bias); masking of participants, study investigators, and outcome assessors (detection bias); incomplete outcome data (attrition bias); selective outcome reporting (reporting bias); and other sources of bias. Masking of investigators and participants may not have been possible with some of the tests being examined but was noted when mentioned. The reviewers reported judgments for each criterion as "low risk of bias," "high risk of bias," or "unclear risk of bias (information is insufficient to assess)." The two reviewers resolved disagreements through discussion.

Two reviewers assessed the methodological rigor of observational studies using a modified version of the Newcastle Ottawa Scale. The Newcastle Ottawa Scale includes domains to assess the quality of study group selection (representativeness, selection, case definitions); comparability of cohorts/cases and controls on the basis of the design or analysis; and ascertainment of exposure(s) or outcome(s), adequacy of follow-up, nonresponse rate, and financial or other conflicts of interest. Each item query required a "yes," "no," or "unable to determine/not reported" response.

For KQ3, the reviewers used the Quality Assessment of Diagnostic Accuracy Studies (QUADAS) checklist, which is a specific risk-of-bias assessment for diagnostic accuracy studies. The QUADAS tool includes 14 items that evaluate numerous domains, including representativeness, inclusion/exclusion criteria, choice of reference standard, masked interpretation of results of tests and reference standard, and study withdrawal. They reported judgments for each checklist item as "yes," "no," or "unclear."

The reviewers used a tool adapted by Li (2010) from the Critical Appraisal Skills Program, Assessment of Multiple Systematic Reviews, and the Preferred Reporting Items for Systematic Reviews and Meta-Analyses statement to assess the methodological quality of systematic reviews. The reviewers used the following criteria, adapted from Li, to determine which were of sufficient quality to be considered for inclusion in this review: comprehensive search for primary studies (searches of more than one bibliographic database), inclusion of a risk-of-bias assessment of primary studies, and conduct of appropriate analytic methods for meta-analyses (no pooled-arm analysis).

Methods Used to Formulate the Recommendations

Balance Sheets

Expert Consensus

Description of Methods Used to Formulate the Recommendations

The U.S. Preventive Services Task Force (USPSTF) systematically reviews the evidence concerning both the benefits and harms of widespread implementation of a preventive service. It then assesses the certainty of the evidence and the magnitude of the benefits and harms. On the basis of this assessment, the USPSTF assigns a letter grade to each preventive service signifying its recommendation about provision of the service (see table below). An important, but often challenging, step is determining the balance between benefits and harms to estimate "net benefit" (that is, benefits minus harms).

Table 1. U.S. Preventive Services Task Force Recommendation Grid*

Certainty of Net Benefit	Magnitude of Net Benefit			
	Substantial	Moderate	Small	Zero/Negative
High	A	B	C	D
Moderate	B	B	C	D
Low	Insufficient			

*A, B, C, D, and I (*Insufficient*) represent the letter grades of recommendation or statement of insufficient evidence assigned by the U.S. Preventive Services Task Force after assessing certainty and magnitude of net benefit of the service (see the "Rating Scheme for the Strength of the

Recommendations" field).

The overarching question that the Task Force seeks to answer for every preventive service is whether evidence suggests that provision of the service would improve health outcomes if implemented in a general primary care population. For screening topics, this standard could be met by a large randomized, controlled trial (RCT) in a representative asymptomatic population with follow-up of all members of both the group "invited for screening" and the group "not invited for screening."

Direct RCT evidence about screening is often unavailable, so the Task Force considers indirect evidence. To guide its selection of indirect evidence, the Task Force constructs a "chain of evidence" within an analytic framework. For each key question, the body of pertinent literature is critically appraised, focusing on the following 6 questions:

1. Do the studies have the appropriate research design to answer the key question(s)?
2. To what extent are the existing studies of high quality? (i.e., what is the internal validity?)
3. To what extent are the results of the studies generalizable to the general U.S. primary care population and situation? (i.e., what is the external validity?)
4. How many studies have been conducted that address the key question(s)? How large are the studies? (i.e., what is the precision of the evidence?)
5. How consistent are the results of the studies?
6. Are there additional factors that assist the USPSTF in drawing conclusions (e.g., presence or absence of dose–response effects, fit within a biologic model)?

The next step in the Task Force process is to use the evidence from the key questions to assess whether there would be net benefit if the service were implemented. In 2001, the USPSTF published an article that documented its systematic processes of evidence evaluation and recommendation development. At that time, the Task Force's overall assessment of evidence was described as good, fair, or poor. The Task Force realized that this rating seemed to apply only to how well studies were conducted and did not fully capture all of the issues that go into an overall assessment of the evidence about net benefit. To avoid confusion, the Task Force has changed its terminology. Whereas individual study quality will continue to be characterized as good, fair, or poor, the term certainty will now be used to describe the Task Force's assessment of the overall body of evidence about net benefit of a preventive service and the likelihood that the assessment is correct. Certainty will be determined by considering all 6 questions listed above; the judgment about certainty will be described as high, moderate, or low.

In making its assessment of certainty about net benefit, the evaluation of the evidence from each key question plays a primary role. It is important to note that the Task Force makes recommendations for real-world medical practice in the United States and must determine to what extent the evidence for each key question—even evidence from screening RCTs or treatment RCTs—can be applied to the general primary care population. Frequently, studies are conducted in highly selected populations under special conditions. The Task Force must consider differences between the general primary care population and the populations studied in RCTs and make judgments about the likelihood of observing the same effect in actual practice.

It is also important to note that one of the key questions in the analytic framework refers to the potential harms of the preventive service. The Task Force considers the evidence about the benefits and harms of preventive services separately and equally. Data about harms are often obtained from observational studies because harms observed in RCTs may not be representative of those found in usual practice and because some harms are not completely measured and reported in RCTs.

Putting the body of evidence for all key questions together as a chain, the Task Force assesses the certainty of net benefit of a preventive service by asking the 6 major questions listed above. The Task Force would rate a body of convincing evidence about the benefits of a service that, for example, derives from several RCTs of screening in which the estimate of benefits can be generalized to the general primary care population as "high" certainty (see the "Rating Scheme for the Strength of the Recommendations" field). The Task Force would rate a body of evidence that was not clearly applicable to general practice or has other defects in quality, research design, or consistency of studies as "moderate" certainty. Certainty is "low" when, for example, there are gaps in the evidence linking parts of the analytic framework, when evidence to determine the harms of treatment is unavailable, or when evidence about the benefits of treatment is insufficient. Table 4 in the methodology document listed below (see the "Availability of Companion Documents" field) summarizes the current terminology used by the Task Force to describe the critical assessment of evidence at all 3 levels: individual studies, key questions, and overall certainty of net benefit of the preventive service.

Sawaya GF et al. Update on the methods of the U.S. Preventive Services Task Force: estimating certainty and magnitude of net benefit. *Ann Intern Med.* 2007;147:871-875. [5 references].

I Statements

For I statements, the USPSTF has a new plan to commission its Evidence-based Practice Centers to collect information in 4 domains pertinent to

clinical decisions about prevention and to report this information routinely. This plan is described in the paper: Petitti DB et al. Update on the methods of the U.S. Preventive Services Task Force: insufficient evidence. *Ann Intern Med.* 2009;150:199-205. <http://annals.org/article.aspx?articleid=744255>

The first domain is potential preventable burden of suffering from the condition. When evidence is insufficient, provision of an intervention designed to prevent a serious condition (such as dementia) might be viewed more favorably than provision of a service designed to prevent a condition that does not cause as much suffering (such as rash). The USPSTF recognized that "burden of suffering" is subjective and involves judgment. In clinical settings, it should be informed by patient values and concerns.

The second domain is potential harm of the intervention. When evidence is insufficient, an intervention with a large potential for harm (such as major surgery) might be viewed less favorably than an intervention with a small potential for harm (such as advice to watch less television). The USPSTF again acknowledges the subjective nature and the difficulty of assessing potential harms: for example, how bad is a "mild" stroke?

The third domain is cost—not just monetary cost, but opportunity cost, in particular the amount of time a provider spends to provide the service, the amount of time the patient spends to partake of it, and the benefits that might derive from alternative uses of the time or money for patients, clinicians, or systems. Consideration of clinician time is especially important for preventive services with only insufficient evidence because providing them could "crowd out" provision of preventive services with proven value, services for conditions that require immediate action, or services more desired by the patient. For example, a decision to routinely inspect the skin could take up the time available to discuss smoking cessation, or to address an acute problem or a minor injury that the patient considers important.

The fourth domain is current practice. This domain was chosen because it is important to clinicians for at least 2 reasons. Clinicians justifiably fear that not doing something that is done on a widespread basis in the community may lead to litigation. More important, addressing patient expectations is a crucial part of the clinician–patient relationship in terms of building trust and developing a collaborative therapeutic relationship. The consequences of not providing a service that is neither widely available nor widely used are less serious than not providing a service accepted by the medical profession and thus expected by patients. Furthermore, ingrained care practices are difficult to change, and efforts should preferentially be directed to changing those practices for which the evidence to support change is compelling.

Although the reviewers did not explicitly recognize it when these domains were chosen, the domains all involve consideration of the potential consequences—for patients, clinicians, and systems—of providing or not providing a service. Others writing about medical decision making in the face of uncertainty have suggested that the consequences of action or inaction should play a prominent role in decisions.

Rating Scheme for the Strength of the Recommendations

What the U.S. Preventive Services Task Force (USPSTF) Grades Mean and Suggestions for Practice

Grade	Grade Definitions	Suggestions for Practice
A	The USPSTF recommends the service. There is high certainty that the net benefit is substantial.	Offer or provide this service.
B	The USPSTF recommends the service. There is high certainty that the net benefit is moderate or there is moderate certainty that the net benefit is moderate to substantial.	Offer or provide this service.
C	The USPSTF recommends selectively offering or providing this service to individual patients based on professional judgment and patient preferences. There is at least moderate certainty that the net benefit is small.	Offer or provide this service only if other considerations support offering or providing the service in an individual patient.
D	The USPSTF recommends against the service. There is moderate or high certainty that the service has no net benefit or that the harms outweigh the benefits.	Discourage the use of this service.
I Statement	The USPSTF concludes that the current evidence is insufficient to assess the balance of benefits and harms of the service. Evidence is lacking, of poor quality, or conflicting, and the balance of benefits and harms cannot be measured.	Read "Clinical Considerations" section of USPSTF Recommendation Statement (see the "Major Recommendations" field). If the service is offered, patients should understand the uncertainty about the balance of benefits and harms.

Definition: The USPSTF defines *certainty* as "likelihood that the USPSTF assessment of the net benefit of a preventive service is correct." The net benefit is defined as benefit minus harm of the preventive service as implemented in a general, primary care population. The USPSTF assigns a certainty level based on the nature of the overall evidence available to assess the net benefit of a preventive service.

Level of Certainty	Description
High	The available evidence usually includes consistent results from well-designed, well-conducted studies in representative primary care populations. These studies assess the effects of the preventive service on health outcomes. This conclusion is therefore unlikely to be strongly affected by the results of future studies.
Moderate	<p>The available evidence is sufficient to determine the effects of the preventive service on health outcomes, but confidence in the estimate is constrained by factors such as:</p> <ul style="list-style-type: none"> • The number, size, or quality of individual studies • Inconsistency of findings across individual studies • Limited generalizability of findings to routine primary care practice; and • Lack of coherence in the chain of evidence <p>As more information becomes available, the magnitude or direction of the observed effect could change, and this change may be large enough to alter the conclusion.</p>
Low	<p>The available evidence is insufficient to assess effects on health outcomes. Evidence is insufficient because of:</p> <ul style="list-style-type: none"> • The limited number or size of studies • Important flaws in study design or methods • Inconsistency of findings across individual studies • Gaps in the chain of evidence • Findings not generalizable to routine primary care practice; and • A lack of information on important health outcomes <p>More information may allow an estimation of effects on health outcomes.</p>

Cost Analysis

A formal cost analysis was not performed and published cost analyses were not reviewed.

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 determinations about recommendations on a given preventive service, the Evidence-based Practice Center and the Agency for Healthcare Research and Quality send a draft evidence review to 4 to 6 external experts and to Federal agencies and professional and disease-based health organizations with interests in the topic. The experts are asked 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 USPSTF in memo form. In this way, the USPSTF can consider these external comments before it votes on its recommendations about the service. Draft recommendation statements are then circulated for comment among reviewers representing professional societies, voluntary organizations, and Federal agencies, as well as posted on the Task Force Web site for public comment. These comments are discussed before the final recommendations are confirmed.

Response to Public Comment. A draft version of this recommendation statement was posted for public comment on the USPSTF Web site from 19 February to 18 March 2013. A few comments noted that important population subgroups are at increased risk for glaucoma. The USPSTF

updated the section on risk with new information on Hispanics. A few comments disagreed that there is no accepted gold standard for screening for glaucoma. None of the comments came to a consensus on an accepted standard for screening, and no change was made to the recommendation statement.

A few comments cited studies to provide evidence on the link between visual field loss and quality of life. The USPSTF reviewed these studies and determined that they did not provide the necessary evidence to change its conclusions. The USPSTF made several minor revisions to the recommendation statement in response to requests for corrections and clarifications.

Comparison with Guidelines from Other Groups. Recommendations for screening from the following groups were discussed: the American Academy of Ophthalmology and the American Optometric Association.

Evidence Supporting the Recommendations

Type of Evidence Supporting the Recommendations

The type of supporting evidence is not specifically stated for each recommendation.

Benefits/Harms of Implementing the Guideline Recommendations

Potential Benefits

Benefits of Detection and Early Treatment

The U.S. Preventive Services Task Force (USPSTF) found no direct evidence on the benefits of screening.

The USPSTF found convincing evidence that treatment of increased intraocular pressure (IOP) and early glaucoma reduces the number of persons who develop small, clinically unnoticeable visual field defects and that treatment of early asymptomatic primary open-angle glaucoma (POAG) decreases the number of persons whose visual field defects worsen.

However, the USPSTF found inadequate evidence that screening for or treatment of increased IOP or early asymptomatic POAG reduces the number of persons who will develop impaired vision or quality of life.

Potential Harms

Harms of Detection and Early Treatment

The U.S. Preventive Services Task Force (USPSTF) found no direct evidence on the harms of screening. It found convincing evidence that treatment results in numerous harms, including local eye irritation from medications and risk for complications from surgery, such as early formation of cataracts. The magnitude of these harms for most persons is small. Screening is associated with a risk for false-positive and false-negative results, but the magnitude of this risk is unknown, given the considerable variability in reported test sensitivity and specificity. Screening and treatment are associated with risk for overdiagnosis and overtreatment because some evidence shows that many persons with increased intraocular pressure (IOP) or early primary open-angle glaucoma (POAG) have an indolent long-term course yet still receive treatment.

Qualifying Statements

Qualifying Statements

- Recommendations made by the U.S. Preventive Services Task Force (USPSTF) are independent of the U.S. government. They should not be construed as an official position of the Agency for Healthcare Research and Quality or the U.S. Department of Health and Human Services.
- The USPSTF makes recommendations about the effectiveness of specific clinical preventive services for patients without related signs or

symptoms.

- It bases its recommendations on the evidence of both the benefits and harms of the service and an assessment of the balance. The USPSTF does not consider the costs of providing a service in this assessment.
- The USPSTF recognizes that clinical decisions involve more considerations than evidence alone. Clinicians should understand the evidence but individualize decision making to the specific patient or situation. Similarly, the USPSTF notes that policy and coverage decisions involve considerations in addition to the evidence of clinical benefits and harms.

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 USPSTF Task Force will make all its 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 USPSTF materials and adapt them for their local needs. Online access to USPSTF 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

Mobile Device Resources

Patient Resources

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

Patient-centeredness

Identifying Information and Availability

Bibliographic Source(s)

U.S. Preventive Services Task Force. Screening for glaucoma: U.S. Preventive Services Task Force recommendation statement. *Ann Intern Med.* 2013 Oct 1;159(7):484-9. [15 references] [PubMed](#)

Adaptation

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

Date Released

2005 Mar 29 (revised 2013 Oct 1)

Guideline Developer(s)

U.S. 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 USPSTF do not necessarily reflect policy of the U.S. Department of Health and Human Services (DHHS) or its agencies.

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The U.S. Preventive Services Task Force (USPSTF) is an independent, voluntary body. The U.S. Congress mandates that the Agency for Healthcare Research and Quality support the operations of the USPSTF.

Guideline Committee

U.S. Preventive Services Task Force (USPSTF)

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*Members of the USPSTF at the time this recommendation was finalized. For a list of current Task Force members, go to <http://www.uspreventiveservicestaskforce.org/Page/Name/our-members> .

Financial Disclosures/Conflicts of Interest

The U.S. Preventive Services Task Force (USPSTF) has an explicit policy concerning conflict of interest. All members disclose at each meeting if they have a significant financial, professional/business, or intellectual conflict for each topic being discussed. USPSTF members with conflicts may be recused from discussing or voting on recommendations about the topic in question.

Potential Conflicts of Interest: None disclosed. Disclosure forms from USPSTF members can be viewed at www.acponline.org/authors/icmje/ConflictOfInterestForms.do?msNum=M13-1387 .

Guideline Status

This is the current release of the guideline.

This guideline updates a previously published guideline: U.S. Preventive Services Task Force (USPSTF). Screening for glaucoma: recommendation statement. Rockville (MD): Agency for Healthcare Research and Quality (AHRQ); 2005 Mar. 9 p.

This guideline meets NGC's 2013 (revised) inclusion criteria.

Guideline Availability

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

Availability of Companion Documents

The following are available:

Evidence Reviews:

- Boland MV, Ervin AM, Friedman DS, Jampel HD, Hawkins BS, Vollenweider D, Chelladurai Y, Ward D, Suarez-Cuervo C, Robinson KA. Comparative effectiveness of treatments for open-angle glaucoma: a systematic review for the U.S. Preventive Services Task Force. *Ann Intern Med.* 2013 Feb 19;158(4):271-279.
- Ervin AM, Boland MV, Myrowitz EH, Prince J, Hawkins B, Vollenweider D, Ward D, Suarez-Cuervo C, Robinson KA. Screening for glaucoma: comparative effectiveness. Comparative Effectiveness Review No. 59. AHRQ Publication No. 12-EHC037-EF. Rockville (MD): Agency for Healthcare Research and Quality; 2012 Apr. 267 p.
- Boland MV, Ervin AM, Friedman D, Jampel H, Hawkins B, Vollenweider D, Chelladurai Y, Ward D, Suarez-Cuervo C, Robinson KA. Treatment for glaucoma: comparative effectiveness. Comparative Effectiveness Review No. 60. AHRQ Publication No. 12-EHC038-EF. Rockville (MD): Agency for Healthcare Research and Quality; 2012 Apr. 443 p.

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

Background Articles:

- Barton MB et al. How to read the new recommendation statement: methods update from the U.S. Preventive Services Task Force. *Ann Intern Med* 2007;147:123-127.
- Guirguis-Blake J et al. Refining evidence-based recommendation development. *Ann Intern Med* 2007;147:117-122.
- Sawaya GF et al. Estimating certainty and magnitude of net benefit. *Ann Intern Med* 2007;147:871-875.
- Petitti DB et al. Insufficient evidence. *Ann Intern Med*. 2009;150:199-205.

Electronic copies: Available from the [USPSTF Web site](#) .

The following are also available:

- Clinical summary of U.S. Preventive Services Task Force recommendation. Rockville (MD): U.S. Preventive Services Task Force; 2013 Oct. Electronic copies: Available from the [USPSTF Web site](#) .
- The guide to clinical preventive services, 2012. Recommendations of the U.S. Preventive Services Task Force. Rockville (MD): Agency for Healthcare Research and Quality; 2012. 128 p. Electronic copies available from the [AHRQ Web site](#) . See the related QualityTool summary on the [Health Care Innovations Exchange Web site](#) .

The [Electronic Preventive Services Selector \(ePSS\)](#) is an application designed to provide primary care clinicians and health care teams timely decision support regarding appropriate screening, counseling, and preventive services for their patients. It is based on the current, evidence-based 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 are available:

- Understanding task force recommendations: screening for glaucoma consumer fact sheet. Rockville (MD): Agency for Healthcare Research and Quality; 2013 Jul. 3 p. Electronic copies: Available from the [U.S. Preventive Services Task Force \(USPSTF\) Web site](#) .
- Screening for glaucoma. U.S. Preventive Services Task Force recommendation statement. Summary for patients. *Ann Intern Med*. 2013 Oct 1;159(7):I-28. Electronic copies: Available from the [Annals of Internal Medicine Web site](#) .
- Men: stay healthy at any age. Your checklist for health. Rockville (MD): Agency for Healthcare Research and Quality (AHRQ). AHRQ Pub. No. 10-IP004-A. 2010 Aug. 2 p. Electronic copies: Available in [English](#) and [Spanish](#) from the AHRQ Web site. See the related QualityTool summary on the [Health Care Innovations Exchange Web site](#) .
- Women: stay healthy at any age. Your checklist for health. Rockville (MD): Agency for Healthcare Research and Quality. AHRQ Pub. No. 10-IP002-A. 2010 Aug. 2 p. Electronic copies: Available in [English](#) and [Spanish](#) from the AHRQ Web site. See the related QualityTool summary on the [Health Care Innovations Exchange Web site](#) .

Print copies: Available in English and Spanish from the AHRQ Publications Clearinghouse. For more information, go to <http://www.ahrq.gov/research/publications/index.html> or call 1-800-358-9295 (U.S. only).

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