Agency for Healthcare Research and Quality
Advancing Excellence in Health Care

NATIONAL GUIDELINE CLEARINGHOUSE

General

Guideline Title

Final recommendation statement: vision in children ages 6 months to 5 years: screening.

Bibliographic Source(s)

Final recommendation statement: vision in children ages 6 months to 5 years: screening. [internet]. Rockville (MD): U.S. Preventive Services Task Force (USPSTF); 2017 Sep [9 p]. [43 references]

Guideline Status

This is the current release of the guideline.

This guideline updates a previous version: Vision screening for children 1 to 5 years of age: US Preventive Services Task Force Recommendation statement. Pediatrics. 2011 Feb;127(2):340-6.

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

NEATS Assessment

National Guideline Clearinghouse (NGC) has assessed this guideline's adherence to standards of trustworthiness, derived from the Institute of Medicine's report Clinical Practice Guidelines We Can Trust.

= Poor = Fair = Good = Very Good = Excellent

Assessment	Standard of Trustworthiness
YES	Disclosure of Guideline Funding Source
	Disclosure and Management of Financial Conflict of Interests
	Guideline Development Group Composition
YES	Multidisciplinary Group

YES	Methodologist Involvement
▮▮▯▯▯	Patient and Public Perspectives
	Use of a Systematic Review of Evidence
▮▮▮▮▮	Search Strategy
▮▮▮▮▮	Study Selection
▮▮▮▮▮	Synthesis of Evidence
	Evidence Foundations for and Rating Strength of Recommendations
▮▮▮▮▮	Grading the Quality or Strength of Evidence
▮▮▮▮▮	Benefits and Harms of Recommendations
▮▮▮▮▮	Evidence Summary Supporting Recommendations
▮▮▮▮▮	Rating the Strength of Recommendations
▮▮▮▮▮	**Specific and Unambiguous Articulation of Recommendations**
▮▮▮▯▯	**External Review**
▮▮▮▮▮	**Updating**

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.

Recommendation Summary

The USPSTF recommends vision screening at least once in all children aged 3 to 5 years to detect amblyopia or its risk factors. (B recommendation)

The USPSTF concludes that the current evidence is insufficient to assess the balance of benefits and harms of vision screening in children younger than 3 years. (I statement)

Clinical Considerations

Patient Population Under Consideration

This recommendation applies to children aged 6 months to 5 years.

Risk Factors Associated With Amblyopia

Although all children aged 3 to 5 years are at risk of vision abnormalities and should be screened, there are certain risk factors that increase risk. Risk factors for amblyopia include strabismus; high, uncorrected

refractive errors (e.g., myopia, hyperopia, and astigmatism); anisometropia; and media opacity. Additional risk factors associated with amblyopia, strabismus, or refractive errors include family history in a first-degree relative, prematurity, low birth weight, maternal substance abuse, maternal smoking during pregnancy, and low levels of parental education.

Screening Tests

A variety of screening tests are used to identify vision abnormalities in children in primary care settings. Visual acuity tests screen for visual deficits associated with amblyopia and refractive error. Ocular alignment tests screen for strabismus. Steroacuity tests assess depth perception. For children younger than 3 years, screening may include the fixation and follow test (for visual acuity), the red reflex test (for media opacity), and the corneal light reflex test (for strabismus). Instrument-based vision screening (i.e., with autorefractors and photoscreeners) may be used in very young children, including infants. Autorefractors are computerized instruments that detect refractive errors; photoscreeners detect amblyopia risk factors (ocular alignment and media opacity) and refractive errors. Vision screening in children older than 3 years may include the red reflex test, the cover-uncover test (for strabismus), the corneal light reflex test, visual acuity tests (e.g., Snellen, Lea Symbols [Lea-Test], and HOTV [Precision Vision] charts), autorefractors and photoscreeners, and stereoacuity tests. Children with positive findings should be referred for a complete eye examination to confirm the presence of vision problems and for further treatment.

Screening Interval

The USPSTF did not find adequate evidence to determine the optimal screening interval in children aged 3 to 5 years.

Treatment

Treatment depends on the specific condition and includes correction of any underlying refractive error with the use of corrective lenses, occlusion therapy for amblyopia (e.g., eye patching, atropine eye drops, or Bangerter occlusion foils), or surgical interventions for some causes of refractory strabismus.

Suggestions for Practice Regarding the I Statement

Potential Preventable Burden

Untreated amblyopia is not likely to spontaneously resolve. Treatment efficacy decreases with age, with a risk of irreversible vision loss. Untreated vision abnormalities can result in short- and long-term physical and psychological harms, such as accidents and injuries, experiencing bullying behaviors, poor visual motor skills, depression and anxiety, poor self-esteem, and problems at school and work.

Current Practice

Vision screening is routinely offered in most primary care settings. Screening rates among children aged 3 years are approximately 40% and increase with age. One survey reported that 3% of pediatricians began vision screening at age 6 months. Typical components of vision screening include assessments of visual acuity and strabismus. Younger children (<3 years) are often unable to cooperate with some of the clinical screening tests performed in clinical practice, such as visual acuity testing, which may result in false-positive results. Some clinical practice guidelines now recommend using handheld autorefractors and photoscreeners as alternative approaches to screening in children 6 months and older because of improved child cooperation and improved accuracy.

One potential disadvantage of using some types of photoscreeners is the need for external interpretation of screening results. Children with positive findings should be referred for a complete eye examination to confirm the presence of vision abnormalities and for further treatment.

Definitions

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

Grade	Definition	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 for selected patients depending on individual circumstances.
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 determined.	Read the "Clinical Considerations" section of the 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 U.S. Preventive Services Task Force 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	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: The number, size, or quality of individual studies Inconsistency of findings across individual studies Limited generalizability of findings to routine primary care practice Lack of coherence in the chain of evidence 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.
Low	The available evidence is insufficient to assess effects on health outcomes. Evidence is insufficient because of: 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 A lack of information on important health outcomes More information may allow an estimation of effects on health outcomes.

Clinical Algorithm(s)

None provided

Scope

Disease/Condition(s)

Vision abnormalities:

- Refractive errors
- Media opacity (e.g., cataracts)
- Strabismus
- Amblyopia

Guideline Category

Prevention

Screening

Clinical Specialty

Family Practice

Ophthalmology

Optometry

Pediatrics

Preventive Medicine

Intended Users

Advanced Practice Nurses

Allied Health Personnel

Nurses

Optometrists

Physician Assistants

Physicians

Guideline Objective(s)

To update the 2011 U.S. Preventive Services Task Force (USPSTF) recommendation on screening for amblyopia and its risk factors in children

Target Population

Children aged 6 months to 5 years

Interventions and Practices Considered

Vision screening in children to detect amblyopia or its risk factors

Major Outcomes Considered

- Key Question 1: Does screening for amblyopia, its risk factors, and refractive error in children aged 6 months to 5 years reduce long-term amblyopia or improve visual acuity, school performance, functioning, and/or quality of life?
  a. Does the effectiveness of screening in children aged 6 months to 5 years vary among different age groups?
- Key Question 2: What are the accuracy and reliability of screening tests for amblyopia, its risk factors, and refractive error in children aged 6 months to 5 years?
  a. Do the accuracy and reliability of screening tests for amblyopia, its risk factors, and refractive error vary among different age groups?
- Key Question 3: What are the harms of screening for amblyopia, its risk factors, and refractive error in children aged 6 months to 5 years?
- Key Question 4
  a. Does treatment of amblyopia, its risk factors, and refractive error in children aged 6 months to 5 years improve visual acuity?
  b. Does treatment of amblyopia, its risk factors, and refractive error in children aged 6 months to 5 years reduce long-term amblyopia or improve school performance, functioning, and/or quality of life?
- Key Question 5: What are the harms of treating amblyopia, its risk factors, and refractive error in children aged 6 months to 5 years?

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

Searches of Unpublished Data

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 for the U.S. Preventive Services Task Force (USPSTF) (see the "Availability of Companion Documents" field).

Data Sources and Searches

PubMed/MEDLINE, the Cochrane Library, and the Cumulative Index to Nursing and Allied Health Literature (CINAHL) were searched for English-language articles published from January 2009 through June 2016. Search strategies are listed in the Appendix B in the systematic review. To identify relevant studies published before 2009, all articles included in the 2011 systematic review for the USPSTF were assessed. ClinicalTrials.gov and the World Health Organization International Clinical Trials Registry platform were

searched for unpublished literature. To supplement electronic searches, the reference lists of pertinent articles, all studies suggested by reviewers, and comments received during public commenting periods were reviewed. Since June 2016, ongoing surveillance was conducted through article alerts and targeted searches of high-impact journals to identify major studies published in the interim that may affect the conclusions or understanding of the evidence and therefore the related USPSTF recommendation. The last surveillance was conducted on June 7, 2017.

Study Selection

Two investigators independently reviewed titles, abstracts, and full-text articles to determine eligibility using prespecified criteria for each key question (KQ) (see Appendix B in the systematic review). Disagreements were resolved by discussion. The review included English-language studies of children aged 6 months to 5 years conducted in countries categorized as "very high" on the United Nations Human Development Index. Only studies rated as good or fair quality were included.

Number of Source Documents

See the literature search flow diagram (Figure 2) in the systematic review (see the "Availability of Companion Documents" field) for a summary of evidence search and selection.

Articles included for Key Questions (KQs):

KQ1: 3 (2 studies)
KQ2: 38 (34 studies)
KQ3: 18 (17 studies)
KQ4: 3 (3 studies)
KQ5: 4 (3 studies)

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

Two independent investigators assessed the quality of studies as good, fair, or poor, using predefined criteria developed by the U.S. Preventive Services Task Force (USPSTF) and adapted for this topic (see Appendix B in the systematic review [see the "Availability of Companion Documents" field]). Disagreements were resolved by discussion. Individual study quality ratings are reported in the systematic review.

Methods Used to Analyze the Evidence

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 for the U.S. Preventive Services Task Force (USPSTF) (see the "Availability of Companion Documents" field).

Data Extraction and Quality Assessment

For each included study, 1 investigator extracted pertinent information about the populations, tests or

treatments, comparators, outcomes, settings, and designs, and a second investigator reviewed for completeness and accuracy. To provide a consistent metric for visual acuity outcome measures, results were converted to logarithm of the minimal angle of resolution (logMAR) measurements using established conversion charts. Measures of visual acuity are generally reported as Snellen (e.g., 20/20, 20/25, 20/30, 20/40, 20/50) or logMAR scales (e.g., 0.00, 0.09, 0.18, 0.30, 0.40). Two independent investigators assessed the quality of studies as good, fair, or poor, using predefined criteria developed by the USPSTF and adapted for this topic (see Appendix B in the systematic review [see the "Availability of Companion Documents" field]). Disagreements were resolved by discussion. Individual study quality ratings are reported in the systematic review.

Data Synthesis and Analysis

Findings for each question were summarized in tabular and narrative format. Results of test accuracy studies were not quantitatively pooled because of considerable clinical and methodological heterogeneity (e.g., different tests, target condition definitions, populations, and results), and there were too few treatment trials making similar comparisons to attempt quantitative synthesis.

For Key Question (KQ) 2, sensitivities, specificities, likelihood ratios (LRs), and predictive values were calculated when articles reported sufficient data. When qualitatively evaluating LRs, positive LRs indicated a minimal (>1-2), small (>2-5), moderate (>5-10), or large (>10) increase in the risk of the condition of interest (e.g., amblyopia or its risk factors). Negative LRs indicated a minimal (0.5-<1), small (0.2-<0.5), moderate (0.1-<0.2), or large (<0.1) decrease in the risk of the condition of interest. Likelihood ratios less than 0.1 or greater than 10 provide strong evidence for ruling out (negative LR <0.1) or ruling in (positive LR >10) diagnoses.

Definitions for what constitutes a minimal clinically important change in visual acuity in young children vary across studies. Recent studies consider a change of 0.2 logMAR (about 2 lines on the Snellen chart) the minimal clinically important change. Others consider smaller changes clinically meaningful, generally between 0.10 logMAR (about 1 line on the Snellen chart) and 0.15 logMAR (between 1 and 2 lines). Large treatment studies have calculated sample size requirements based on the ability to detect a change of at least 0.1 logMAR between treatment groups. When assessing whether improvement in visual acuity represents a clinically meaningful change, practitioners may also consider that visual impairment associated with amblyopia can become permanent and may limit function for the child's lifetime.

The overall strength of the body of evidence was assessed for each KQ as high, moderate, low, or insufficient using methods developed for the USPSTF (and the Evidence-based Practice Center program), based on the overall quality of studies, consistency of results between studies, precision of findings, and risk of reporting bias.

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).

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 USPSTF 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 USPSTF 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 USPSTF 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:

Do the studies have the appropriate research design to answer the key question(s)?
To what extent are the existing studies of high quality? (i.e., what is the internal validity?)
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?)
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?)
How consistent are the results of the studies?
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 USPSTF 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 USPSTF's overall assessment of evidence was described as good, fair, or poor. The USPSTF 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 USPSTF 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 USPSTF'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 USPSTF 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 USPSTF 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 USPSTF 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 USPSTF assesses the certainty of net benefit of a preventive service by asking the 6 major questions listed above. The USPSTF 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 Recommendations" field). The USPSTF 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 USPSTF 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, Guirguis-Blake J, LeFevre M, Harris R, Petitti D; U.S. Preventive Services Task Force. Update on the methods of the U.S. Preventive Services Task Force: estimating certainty and magnitude of net benefit. Ann Intern Med. 2007;147:871-5. [5 references].

I Statements

For I statements, the USPSTF has a plan to commission its Evidence-based Practice Centers (EPCs) 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. www.annals.org

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	Definition	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 for selected patients depending on individual circumstances.
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 determined.	Read the "Clinical Considerations" section of the 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 U.S. Preventive Services Task Force 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	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: The number, size, or quality of individual studies Inconsistency of findings across individual studies Limited generalizability of findings to routine primary care practice Lack of coherence in the chain of evidence 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.

Level of Certainty	Description
Low	The available evidence is insufficient to assess effects on health outcomes. Evidence is insufficient because of: 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 A lack of information on important health outcomes More information may allow an estimation of effects on health outcomes.

Cost Analysis

The U.S. Preventive Services Task Force (USPSTF) does not consider the costs of providing a service in this assessment.

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 the 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. The draft evidence review is also posted on the USPSTF Web site for public comment. 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 USPSTF 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 February 28 to March 27, 2017. Some comments expressed concern about the scope of the review for screening. The USPSTF added language to clarify that the general eye examination to detect ocular abnormalities was not in scope for this review, and further clarified the language about screening tests in the "Clinical Considerations" section. Other comments expressed concern about the lack of information on health disparities. In response, the USPSTF added language about health disparities to the "Clinical Considerations" section. Some comments did not agree with delaying screening until the age of 3 years. The USPSTF added more language about the lack of evidence regarding screening and treatment in children younger than 3 years to the "Discussion" section. Last, some comments requested information about the effects of screening on learning and quality of life outcomes. The USPSTF revised the "Research Needs and Gaps" section, which discusses these gaps in the evidence on outcomes.

Recommendations of Others

Recommendations for vision screening in children from the following groups were considered: the American Academy of Pediatrics, the American Association for Pediatric Ophthalmology and Strabismus, the American Academy of Certified Orthoptists, the American Academy of Ophthalmology, the American Academy of Family Physicians, and the American Optometric Association.

Evidence Supporting the Recommendations

Type of Evidence Supporting the Recommendations

The type of evidence supporting the recommendations is not specifically stated.

Benefits/Harms of Implementing the Guideline Recommendations

Potential Benefits

Benefits of Early Detection and Treatment

The U.S. Preventive Services Task Force (USPSTF) found adequate evidence that treatment of amblyopia or its risk factors in children aged 3 to 5 years leads to improved visual acuity. The USPSTF determined that the magnitude of improvement in visual acuity is of moderate benefit. The USPSTF found inadequate evidence that treatment reduced the incidence of long-term amblyopia or improved school performance, functioning, or quality of life. Limited evidence suggests that screening can potentially reduce psychosocial harms. The USPSTF found inadequate evidence that treatment of amblyopia or its risk factors in children younger than 3 years leads to improved vision outcomes (i.e., visual acuity) or other benefits.

Potential Harms

Harms of Early Detection and Treatment

The U.S. Preventive Services Task Force (USPSTF) found adequate evidence to assess harms of vision screening tests in children aged 3 to 5 years, including higher false-positive rates in low-prevalence populations. False-positive screening results may lead to overdiagnosis or unnecessary treatment. Limited evidence suggests that eye patching in children aged 3 to 5 years does not worsen visual acuity in the nonamblyopic eye but may be associated with psychological harms, such as child or parental upset or concern. The USPSTF found adequate evidence to bound the potential harms of vision screening and treatment in children aged 3 to 5 years as small, based on the nature of the interventions. The USPSTF found inadequate evidence on the harms of treatment in children younger than 3 years.

Qualifying Statements

Qualifying Statements

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

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 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 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

Mobile Device Resources

Patient Resources

Pocket Guide/Reference Cards

Quick Reference Guides/Physician Guides

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)

Final recommendation statement: vision in children ages 6 months to 5 years: screening. [internet]. Rockville (MD): U.S. Preventive Services Task Force (USPSTF); 2017 Sep [9 p]. [43 references]

Adaptation

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

Date Released

2017 Sep

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.

Source(s) of Funding

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 (AHRQ) support the operations of the USPSTF.

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U.S. Preventive Services Task Force (USPSTF)

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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 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.

Conflict of Interest Disclosures

All authors have completed and submitted the International Committee of Medical Journal Editors (ICMJE) Form for Disclosure of Potential Conflicts of Interest. Authors followed the policy regarding conflicts of interest described at https://www.uspreventiveservicestaskforce.org/Page/Name/conflict-of-interest-disclosures. All members of the USPSTF receive travel reimbursement and an honorarium for participating in USPSTF meetings.

Guideline Status

This is the current release of the guideline.

This guideline updates a previous version: Vision screening for children 1 to 5 years of age: US Preventive Services Task Force Recommendation statement. Pediatrics. 2011 Feb;127(2):340-6.

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

Guideline Availability

Available from the U.S. Preventive Services Task Force (USPSTF) Web site .

Availability of Companion Documents

The following are available:

Evidence Reviews:

> Jonas DE, Amick HR, Wallace IF, Feltner C, Vander Schaaf EB, Brown CL, Baker C. Vision screening in children aged 6 months to 5 years: evidence report and systematic review for the U.S. Preventive Services Task Force. JAMA. 2017 Sep 5;318(9):845-58.
> Jonas DE, Amick HR, Wallace IF, Feltner C, Vander Schaaf EB, Brown CL, Baker C. Vision screening in children ages 6 months to 5 years: a systematic review for the U.S. Preventive Services Task Force. Evidence Synthesis No. 153. AHRQ Publication No. 17-05228-EF-1. Rockville (MD): Agency for Healthcare Research and Quality; 2017 Sep. 178 p.

Available from the U.S. Preventive Services Task Force (USPSTF) Web site .

The following is also available:

> Clinical summary: vision screening in children aged 6 months to 5 years. Rockville (MD): U.S. Preventive Services Task Force; 2017 Sep. 1 p. Available from the USPSTF 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

Myhealthfinder is a tool that provides personalized recommendations for clinical preventive services specific to the user's age, gender, and pregnancy status. It features evidence-based recommendations from the U.S. Preventive Services Task Force (USPSTF) and is available at www.healthfinder.gov .

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 by ECRI Institute on May 5, 2011. The updated information was verified by the guideline developer on June 1, 2011. This summary was updated by ECRI Institute on January 3, 2018. The updated information was verified by the guideline developer on January 11, 2018.

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