Screening for visual impairment in older adults: systematic review to update the 1996 U.S. preventive services task force recommendation

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CRD summary
This review concluded that limited evidence showed screening for impaired visual acuity in older adults in primary care settings was not associated with improved visual or other clinical outcomes, and possibly associated with unintended harms such as increased risk of falls. These conclusions accurately reflected the results and are probably reliable, but were based on one fair-quality trial.

Authors' objectives
To update a previous assessment (see Other Publications of Related Interest) of the benefits and harms and accuracy of screening for impaired visual acuity in adults aged 65 years of over in primary care settings.

The review also covered the effects of treatment (not included in this abstract).

Searching
MEDLINE (from 1996 to July 2008), Cochrane Central Register of Controlled Trials (CENTRAL) and Cochrane Database of Systematic Reviews (up to third quarter 2008) were searched. References of relevant articles were checked and experts were contacted.

Study selection
Randomised controlled trials (RCTs) and controlled observational studies that evaluated the benefits and harms of screening for impaired visual acuity in older adults were eligible for inclusion. Also eligible were controlled observational studies and diagnostic studies that evaluated the accuracy of screening tests for impaired visual acuity in primary care settings. RCTs and controlled observational studies of treatments for impaired visual acuity that resulted from the following causes were also eligible: refractive errors, cataracts and wet and dry age-related macular degeneration; these studies were required to report clinical outcomes such as visual acuity, quality of life, functional capacity, adverse events and mortality. Diagnostic studies were required to report sensitivity, specificity, likelihood ratios or diagnostic odds ratios. Studies in people aged over 65 were preferred, but studies of younger age groups were included if there was insufficient data on older age groups.

Two reviewers selected the papers for inclusion in the review.

Assessment of study quality
Two reviewers independently assessed studies for validity using the criteria of the United States Preventative Services Task Force. Studies were rated as good, fair or poor quality. Criteria used for RCTs were: randomisation; maintenance of group comparability; losses to follow-up; reliability and appropriateness of outcome measures; definition of interventions; and use of intention-to-treat analysis. Cluster randomised trials were assessed for their use of a correlation coefficient. Diagnostic accuracy studies were assessed on the following criteria: relevance; availability and description of test; use of appropriate reference standard; independence of test and reference test interpretation; handling of indeterminate results; spectrum of included participants; sample size; and reliability of test.

Data extraction
For studies of efficacy and safety, data were extracted on relative risks (RR) and their 95% confidence intervals (CI). Data to allow the calculation of sensitivities, specificities, diagnostic odds ratios and positive and negative likelihood ratios were extracted from diagnostic accuracy studies. Positive likelihood ratios were classified as large (>10), moderate (>5 but <10) and small (>2 and <5). The classifications used for negative likelihood ratios were: large (<0.1), moderate (> 0.1 and <0.2) and small (>0.2 and <0.5).
One reviewer performed the data extraction, which was then checked by a second reviewer.

**Methods of synthesis**
The studies were combined in a narrative synthesis grouped by whether they evaluated benefits and harms or accuracy of screening.

**Results of the review**
Three cluster-randomised RCTs (n=4,728) and one non-cluster RCT (n=309) were included in the review. All were considered to be fair quality. Eight cross-sectional studies were included in the review of accuracy.

**Benefits and harms of screening:**
None of the trials found a statistically significant benefit for visual acuity or other clinical outcomes for vision screening as part of a multi-component primary care intervention compared to usual care, delayed screening or no screening.

The one RCT (n=309) that assessed harms found that vision screening carried out by an ophthalmologist in frail older adults was associated with an increased risk of falls (RR 1.57, 95% CI 1.20 to 2.05) and a trend toward an increased risk of fractures (RR 1.74, 95% CI 0.97 to 3.11). There was no evidence on optimal screening intervals.

**Accuracy of screening:**
Four cross-sectional studies found that no screening question was accurate compared to visual acuity testing or a detailed ophthalmologic examination for identification of impaired visual acuity. Visual acuity tests (four studies) and the Amsler grid (one study) were associated with low diagnostic accuracy compared with a detailed ophthalmologic examination. Positive likelihood ratios ranged from 1.00 to 8.07. Negative likelihood ratios ranged from 0.32 to 1.00. There was a lack of evidence for other tests.

**Authors' conclusions**
Limited evidence showed that screening for impaired visual acuity in older adults in primary care settings was not associated with improved visual or other clinical outcomes and may be associated with unintended harms, such as an increased risk of falls.

**CRD commentary**
The review questions and their inclusion criteria were clear. The authors searched some relevant databases and made some attempt to locate unpublished studies. Rigorous methodology was implemented to minimise bias at all stages of the review process. An appropriate validity assessment was conducted and used to inform the synthesis. Clinical heterogeneity between studies made the adoption of a narrative synthesis appropriate. The authors’ conclusions accurately reflected the results of the review and are probably reliable, but it should be borne in mind that the conclusions were based on a single fair-quality RCT.

**Implications of the review for practice and research**
**Practice:** The authors stated that for any vision screening programme to be effective, it must be linked to appropriate eye care and follow-up for patients with impaired visual acuity.

**Research:** The authors stated that more research was needed to understand why the direct evidence on vision screening in older adults showed no benefit despite the availability of effective treatments for common conditions associated with impaired visual acuity. They made the following specific recommendations: well designed studies were needed to identify optimal methods and intervals for vision screening; to develop effective strategies for linking older adults with visual impairment to appropriate care; and to assess the diagnostic accuracy and utility of a number of different screening techniques.

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Record Status
This is a critical abstract of a systematic review that meets the criteria for inclusion on DARE. Each critical abstract contains a brief summary of the review methods, results and conclusions followed by a detailed critical assessment on the reliability of the review and the conclusions drawn.