

Screening for Hearing Loss in Older Adults

US Preventive Services Task Force Recommendation Statement

US Preventive Services Task Force

IMPORTANCE Age-related sensorineural hearing loss is a common health problem among adults. Nearly 16% of US adults 18 years or older report difficulty hearing. The prevalence of perceived hearing loss increases with age. Hearing loss can adversely affect an individual's quality of life and ability to function independently and has been associated with increased risk of falls, hospitalizations, social isolation, and cognitive decline.

OBJECTIVE To update its 2012 recommendation, the US Preventive Services Task Force (USPSTF) commissioned a systematic review on screening for hearing loss in adults 50 years or older.

POPULATION Asymptomatic adults 50 years or older with age-related hearing loss.

EVIDENCE ASSESSMENT Because of a lack of evidence, the USPSTF concludes that the benefits and harms of screening for hearing loss in asymptomatic older adults are uncertain and that the balance of benefits and harms cannot be determined. More research is needed.

RECOMMENDATION The USPSTF concludes that the current evidence is insufficient to assess the balance of benefits and harms of screening for hearing loss in older adults. (I statement)

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Summary of Recommendation

Asymptomatic adults 50 years or older	The US Preventive Services Task Force (USPSTF) concludes that the current evidence is insufficient to assess the balance of benefits and harms of screening for hearing loss in older adults.	I statement
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See the Practice Considerations section for additional information regarding the I statement. USPSTF indicates US Preventive Services Task Force.

See the Summary of Recommendation figure.

Importance

Age-related sensorineural hearing loss is a common health problem among adults. According to data from 2014-2016, approximately 16% of US adults 18 years or older reported difficulty hearing.¹ In a study from 2014, the prevalence of perceived hearing loss increased with age; 43% of adults 70 years or older reported hearing loss, compared with 19% of adults aged 40 to 69 years and 5.5% aged 18 to 39 years.²

Hearing loss can adversely affect an individual's quality of life and ability to function independently. Persons with hearing loss may have difficulty with speech discrimination and localization of sounds.

Hearing loss also has been associated with increased risk of falls, hospitalizations, social isolation, and cognitive decline.³⁻⁵

Assessment of Magnitude of Net Benefit

Because of a lack of evidence, the US Preventive Services Task Force (USPSTF) concludes that the benefits and harms of screening for hearing loss in asymptomatic older adults are uncertain and that the **balance of benefits and harms cannot be determined (Table). More research is needed.**

More information on the USPSTF recommendation rationale and assessment is included in the **Figure**, **Table**, and **eFigure** in the

Table. Summary of USPSTF Rationale

Rationale	Assessment
Detection	Adequate evidence that screening instruments can detect hearing loss
Benefits of screening and intervention and treatment	<ul style="list-style-type: none"> • Inadequate evidence that screening for hearing loss in asymptomatic patients improves health outcomes • Inadequate evidence that interventions to treat hearing loss in screen-detected patients improves health outcomes
Harms of early detection and intervention and treatment	Inadequate evidence to determine the harms of screening for and treatment of hearing loss
USPSTF assessment	The evidence on screening for hearing loss is lacking, and the balance of benefits and harms cannot be determined

Abbreviation: USPSTF, US Preventive Services Task Force.

Figure. Clinician Summary: Screening for Hearing Loss in Older Adults

What does the USPSTF recommend?	For adults 50 years or older who have not noticed any issues with their hearing: The USPSTF found that the evidence is insufficient to assess the balance of benefits and harms of screening for hearing loss in older adults. More research is needed. I statement
To whom does this recommendation apply?	This recommendation applies to asymptomatic older adults (≥50 years) with age-related, sensorineural hearing loss. This recommendation is for persons who have not noticed any issues with their hearing. It does not apply to adults with conductive hearing loss, congenital hearing loss, sudden hearing loss, or hearing loss caused by recent noise exposure, or those reporting signs and symptoms of hearing loss.
What's new?	This recommendation is consistent with the 2012 USPSTF statement.
How to implement this recommendation?	There is insufficient evidence to recommend for or against screening for hearing loss in persons with unrecognized hearing loss. Clinicians should use their clinical judgement about hearing testing for patients who have symptoms of hearing loss or who have raised concerns about their hearing.
Where to read the full recommendation statement?	Visit the USPSTF website (https://www.uspreventiveservicestaskforce.org) to read the full recommendation statement. This includes more details on the rationale of the recommendation, including benefits and harms; supporting evidence; and recommendations of others.

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.

USPSTF indicates US Preventive Services Task Force.

Supplement. For more details on the methods the USPSTF uses to determine the net benefit, see the USPSTF Procedure Manual.⁶

Practice Considerations

Patient Population Under Consideration

This recommendation applies to asymptomatic adults 50 years or older with age-related hearing loss. It does not apply to adults with conductive hearing loss, congenital hearing loss, sudden hearing loss, or hearing loss caused by recent noise exposure, or to persons reporting signs and symptoms of hearing loss.

Definition of Hearing Loss

The normal human ear can process sound frequencies from 20 to 20 000 Hz, with 500 to 4000 Hz being the most important range for speech processing.⁷ There is no universally accepted definition for hearing loss because frequency and intensity (as measured in decibels) thresholds vary depending on the reference criteria used. However, many studies and guidelines define mild hearing loss as the inability to hear frequencies associated with speech processing under 25 dB and moderate hearing loss as the inability to hear those frequencies under 40 dB.⁸

Pure-tone audiometry is the most standard method for quantitative measurements of hearing; however, it is not always correlated with reported symptoms of hearing loss. There is often discordance between objectively measured deficits in hearing on pure-tone audiometry and subjective perceptions of hearing problems.⁹ In one study, 1 in 5 persons who reported hearing loss had a normal hearing test result, while 6% of those with severe hearing loss detected on audiometry did not report feeling that they had hearing loss.¹⁰

Assessment of Risk

Increasing age is the most important risk factor for hearing loss. Presbycusis, a gradual, progressive decline in the ability to perceive high-frequency tones due to degeneration of hair cells in the ear, is the most common cause of hearing loss in older adults.

Screening Tests

Clinical tests to assess for potential hearing loss include the whispered voice, finger rub, and watch tick tests; however, they have questionable accuracy and have been shown to be operator dependent.^{8,11} Perceived hearing loss can also be assessed by single-question screening (asking "Do you have difficulty with your hearing?") or longer patient questionnaires such as the

Hearing Handicap Inventory for the Elderly–Screening (HHIE-S) questionnaire.¹² Technology such as the AudioScope (Welch Allyn), a handheld otoscope with a built-in screening audiometer, or tablet-based audiometry apps can also be used.¹³ Diagnostic confirmation of a positive screening is typically performed with pure-tone audiometry. The finding of objective hearing loss indicates eligibility for an assistive hearing device but may not identify persons who will find the devices helpful and use them.

Treatment or Interventions

Mild or moderate sensorineural hearing loss (mild, 26 to 40 dB; moderate, 41 to 60 dB)¹⁴ is primarily managed with hearing aids. For severe or profound hearing loss (severe, 61 to 80 dB; profound, ≥ 81 dB),¹⁴ cochlear implants and alternative communication techniques (ie, active listening training, speech reading) are potential treatment options.

Suggestions for Practice Regarding the I Statement

Potential Preventable Burden

If left uncorrected, hearing loss can lead to significant hardship for patients, family members, and society. As persons age, moderate to severe hearing loss is associated with significantly higher impairment in instrumental activities of daily living such as driving and managing medications or finances, as well as impairment in basic activities of daily living such as ambulation, bathing, and toileting.¹⁵

Hearing loss is also associated with other adverse social and health outcomes, including social isolation, depression, and dementia.³ Some evidence suggests that hearing loss is also associated with increased hospitalizations and higher rates of mortality.^{5,16,17}

Potential Harms

Because screening and confirmatory testing for hearing impairment are noninvasive and serious harms of treatment are rare, there are likely little to no adverse effects of screening for hearing loss. Potential or theoretical harms include anxiety, labeling, and stigma, as well as middle and outer ear conditions (ie, otitis externa, cerumen impaction) associated with hearing aid use, but these have not been adequately studied.

Current Practice

Accurate estimates of screening rates for hearing loss in adult primary care are not available. Older surveys indicate that primary care clinicians generally agreed that hearing loss negatively affects their patients but reported low screening rates.¹⁸ Clinicians have reported barriers to screening and treatment of hearing loss, including issues such as lack of knowledge, poor perception of audiology services, lack of time, and lack of reimbursement.¹⁸⁻²⁰ Among persons seeking treatment for hearing loss, barriers to receiving care include a lack of awareness of hearing loss; confusion about options for accessing hearing-related care (eg, primary care assessment, audiology evaluation, or over-the-counter device); and decision-making related to treatment options, preferences, and cost.²¹ Additionally, dissatisfaction or difficulties with using hearing aids may factor into the perceived effectiveness of these devices.²¹ In 1 large study (n = 2305) of veterans eligible to receive free hearing aids, only 10% of all participants reported using devices after 1 year.^{22,23} In the same study, among those without self-perceived hearing loss

but with hearing loss diagnosed by audiometry, hearing aid use was 0% to 1.6%. These factors may limit the effectiveness of screening for and treatment of hearing loss.²¹

The benefit of earlier hearing aid use among persons with screen-detected mild hearing loss (with no or little perceived hearing-related functional impairment) is not clear. There is no standard of care or guideline consensus on when hearing aids are recommended, and early use of hearing aids does not prevent or delay further decline in age-related hearing loss.^{24,25}

Update of Previous USPSTF Recommendation

In 2012, the USPSTF found insufficient evidence to assess the balance of benefits and harms of screening for hearing loss in asymptomatic adults 50 years or older.²⁶ The current recommendation statement is consistent with the 2012 statement.

Supporting Evidence

Scope of Review

The USPSTF commissioned a systematic review^{8,27} to update its 2012 recommendation on screening for hearing loss in adults 50 years or older. The scope of this review is similar to that of the prior systematic review.²⁸

Accuracy of Screening Tests and Risk Assessment

Thirty-four studies (6 good-quality and 28 fair-quality) evaluated the diagnostic accuracy of various screening modalities compared with pure-tone audiometry for the detection of hearing impairment in older adults.^{8,27} Nine studies evaluated a clinical test (eg, whispered voice, finger rub), 13 studies evaluated asking a single question, 11 studies evaluated a hearing questionnaire (eg, HHIE-S), and 10 studies evaluated a handheld or mobile-based audiometric device. Many studies assessed multiple screening tools.^{8,27} Most studies included community-dwelling older adults enrolled from outpatient clinical or community settings, although 4 studies included adults in chronic care/rehabilitation facilities. Among the studies that reported age, the median age of study participants was 69 years.^{8,27} Few studies provided racial, ethnic, or socioeconomic data on participants.

Many studies reported on the accuracy of screening tests to detect hearing loss defined by multiple thresholds (eg, >25 dB, >40 dB) averaged over different frequencies; however, studies used slightly different thresholds and criteria (eg, whether 1 or both ears were affected) to define hearing impairment.^{8,27} In general, studies considered hearing loss of 25 to 30 dB as mild hearing loss and loss of 35 to 40 dB as moderate hearing loss.

Thirteen studies assessed the accuracy of single-question screening for detecting hearing loss.⁸ For detecting mild hearing loss, the pooled sensitivity was 66% and pooled specificity was 76% (10 studies; n = 12 637).^{8,27} For moderate hearing loss, the pooled sensitivity was 80% and pooled specificity was 74% (6 studies; n = 8774).

Eleven studies assessed the accuracy of screening questionnaires, 8 of which assessed the accuracy of the HHIE-S.^{8,27} Too few studies reported data to pool accuracy of the HHIE-S for detecting

mild hearing loss. Across 4 studies (n = 7194), sensitivity of the HHIE-S ranged from 34% to 58% and specificity from 76% to 95%.^{8,27} For detecting moderate hearing loss, the pooled sensitivity of HHIE-S (5 studies; n = 2820) was 68% and pooled specificity was 79%.⁸ The Hearing Self-Assessment Questionnaire (HSAQ) and the Revised Five-Minute Hearing Test (RFMHT) were evaluated in 1 study each. For detecting mild hearing loss, the HSAQ had a sensitivity of 89% to 76% and specificity of 84% to 96%, based on 2 standard cutoffs. The sensitivity of the RFMHT for detecting mild hearing loss was 80% and specificity was 55%.^{8,27}

The diagnostic accuracy of clinical tests (eg, whispered voice, watch tick, or finger rub) were evaluated in 9 studies.^{8,27} Six of these assessed the accuracy of the whispered voice test at 6 inches, 2 feet, or both. For detecting mild hearing loss, the pooled sensitivity of the whispered voice test was 94% and specificity was 87%. Sensitivity for detecting at least moderate hearing loss, defined as more than 40 dB, ranged from 30% to 60% and specificity from 80% to 98%.^{8,27} One study of whispered voice test accuracy found difference based on practitioner experience.⁸ Other clinical tests, such as the finger rub and watch tick tests, were evaluated in few studies. In general, for both mild and moderate hearing loss, these tests had low sensitivity and high specificity.^{8,27}

Ten studies evaluated the accuracy of various handheld audiometric screening devices.^{8,27} Two studies assessed the accuracy of the AudioScope to detect mild (>25 to >30 dB) hearing loss and 4 studies assessed the accuracy for detecting moderate (>40 dB) hearing loss. For mild hearing loss, sensitivity ranged from 64% to 93% and specificity ranged from 70% to 91%. There was relatively high sensitivity (range, 94%-100%) for detecting moderate hearing loss, although variable specificity (range, 24%-80%). Four studies assessed tablet-based audiometry apps designed for screening, although only 1, the uHear app, was reviewed in more than 1 study. It reported sensitivity between 68% and 100% and specificity between 87% and 89% for detecting moderate hearing loss (>40 dB).^{8,27}

Benefits of Early Detection and Treatment

Direct evidence of the effect of screening for hearing loss on clinical outcomes is limited. Only 1 fair-quality randomized clinical trial examined the effect of screening on health outcomes. The SAI-WHAT (Screening for Auditory Impairment-Which Hearing Assessment Test) trial (n = 2305) randomly assigned predominantly male veterans 50 years or older to hearing loss screening with the AudioScope, HHIE-S questionnaire, or combined screening vs a control group of no screening.^{22,23} The primary outcome was hearing aid use 1 year after screening. Included participants were predominantly men (94%), 50 years or older (mean age, 61 years), and recruited from a Veterans Affairs medical center. Three-fourths reported self-perceived hearing loss at baseline. Overall, hearing aid use across all study groups was low (<10%) but significantly higher for those screened with the AudioScope or combined screening vs controls. Hearing aid use was very low among participants without baseline perceived hearing impairment (0% to 1.6%).^{22,23} A secondary outcome of the trial was the effect of hearing aid use on quality of life. No statistically significant differences in quality of life scores were observed across the study groups after 1 year; however, the trial was not powered to detect differences in hearing-related function.^{8,27} The generaliz-

ability of these results is limited, as this study was composed of relatively younger (mean age, 61 years) male veterans with a high prevalence of perceived hearing loss and who were eligible for free treatment services.

Several trials reported on hearing aid use and changes in hearing-related function measured by the HHIE-S; however, clinically meaningful improvements in the HHIE-S associated with hearing aid use were limited to studies enrolling veterans who generally had greater baseline hearing impairment.^{8,27} Four studies reported on general quality of life or function and other non-hearing-related health outcomes; of these studies, only 1 found significant benefit in favor of the intervention on the Short Portable Mental Status Questionnaire and the Geriatric Depression Scale. No study examined the effect of interventions on the incidence of dementia or neurocognitive impairment.^{8,27} Overall, the population of white male veterans and higher prevalence of moderate hearing loss at study entry limits the generalizability of these findings.

Harms of Screening and Treatment

No randomized trials or controlled observational studies evaluated potential adverse effects associated with screening or treatment of hearing impairment using hearing aids.^{8,27} Potential harms include false-positive results that lead to unnecessary testing, treatment, or both; labeling; and anxiety. Harms related to treatment are thought to be minimal; however, potential harms of treatment include further hearing loss related to amplification or overamplification.²⁹ Some persons with quantitative hearing loss may not have *perceived* hearing loss or experience negative effects on their quality of life and may not benefit from screening or treatment. Such overdiagnosis and overtreatment could be considered a potential harm.

Response to Public Comments

A draft version of this recommendation statement was posted for public comment on the USPSTF website from September 8, 2020, to October 5, 2020. Many respondents felt that given the costs of hearing impairment (both to quality of life and financially), the USPSTF should recommend screening; however, the USPSTF requires evidence on benefits and harms to recommend a preventive service. The USPSTF recognizes the significant effects of hearing loss and provided more information about additional outcomes such as cognitive function and quality of life in its updated recommendation. Several comments expressed that readers might misinterpret the I statement as a recommendation against screening. In response, the USPSTF wishes to clarify that its I statement is a conclusion that the evidence is insufficient to assess the balance of benefits and harms of screening for hearing loss and is neither a recommendation for nor against screening.

Several comments questioned the scope of the recommendation and the USPSTF's decision to exclude populations (younger adults) and types of hearing loss (ie, conductive hearing loss, congenital hearing loss, sudden hearing loss, or noise-induced hearing loss), as well as those exhibiting early stage dementia. This recommendation focused on screening for sensorineural hearing loss, as it is the most common form of hearing loss in those older than 50 years. This type of hearing loss is both gradual and progressive and much more likely to be unrecognized by patients than other types of hearing loss.

Several comments noted that newer screening modalities that provide objective measures of hearing loss were not considered by the USPSTF. The task force's review included an assessment of several newer screening tools, some of which showed promise but had limited evidence.

How Does the Evidence Fit With Biological Understanding?

Although sensorineural hearing loss is a relatively common consequence of aging, it has a gradual onset, so many older adults may not recognize that they have an impairment or may not perceive their sensory deficits to be a problem. Some individuals may alter their daily activities to adapt to the loss. Additionally, some older adults may resist seeking treatment for hearing impairment or adhering to use of a hearing aid because of fear of social stigma or a feeling of loss of independence, or discomfort associated with hearing aid use.

Research Needs and Gaps

More studies are needed that address the following areas.

- The benefit of screening for and treatment of hearing loss in asymptomatic adults on health outcomes, such as quality of life and function, not just on hearing aid use or quality of hearing.

- The potential harms of screening and treatment, such as false-positive results and overtreatment.
- Consistent use of definitions of hearing loss to improve certainty about the accuracy of screening tests.
- The general adult population, as well as diverse subpopulations.
- The role of over-the-counter assistive hearing devices compared with prescription amplification devices.
- Screening tools that identify not just adults with hearing loss by audiometry definition criteria, but adults with unrecognized hearing loss that would benefit (the most) from amplification.

Recommendations of Others

Several organizations have issued statements about screening for hearing loss in older adults. The American Academy of Family Physicians references the 2012 USPSTF I statement for screening for hearing loss in asymptomatic adults 50 years or older.³⁰ The UK National Screening Committee does not recommend a national screening program for hearing loss in adults 50 years or older.³¹ The American Speech-Language-Hearing Association recommends that adults be screened by an audiologist once per decade and every 3 years after age 50 years or more frequently in those with known exposures or risk factors associated with hearing loss.³²

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Additional Information: The US Preventive Services Task Force (USPSTF) makes recommendations about the effectiveness of specific preventive care 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.

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