



Effective Health Care

Age-Related Hearing Loss

Results of Topic Selection Process & Next Steps

The nominator, American Academy of Otolaryngology—Head and Neck Surgery, is interested in a new evidence review on age-related hearing loss to inform future guideline recommendations and associated quality measures.

Because limited original research addresses the nomination, a new review is not feasible at this time. No further activity on this nomination will be undertaken by the Effective Health Care (EHC) Program.

Topic Brief

Topic Name: Age-Related Hearing Loss

Nomination Date: 01/19/2018

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Author: Diana Pham

Conflict of Interest: None of the investigators have any affiliations or financial involvement that conflicts with the material presented in this report.

Summary

- This nomination meets the selection criteria of appropriateness and importance, duplication, and impact.
- A systematic review is not feasible based on the limited number of identified studies. Only one original study published in the past five years was identified during the feasibility search that addressed the scope of KQs1 & 2 not duplicated by recent reviews. The limited availability of recent published data, partial duplication by recent systematic reviews, and potential for further duplication by in-process reviews resulted in the determination that a systematic review is not feasible at this time.

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Background

Age-related hearing loss (presbycusis) is a type of sensorineural hearing loss and is the most common cause of hearing loss in older adults. Presbycusis is typically gradual, progressive, and bilateral.[1, 2] In population-based studies of community-dwelling older adults (ages 50 years and older), the prevalence of hearing loss ranges from 20 to 40 percent.[1, 3-5] In adults ages 80 years and older, the prevalence increases to over 80 percent.[1]

Hearing loss can impact both quality of life and ability to function in older adults. Individuals with hearing loss may have difficulty with speech discrimination, participation in social activities, ability to enjoy music, and localization of sounds.[6] Hearing loss is associated with increased emotional dysfunction, depression, and social isolation.[7-9] Older adults with moderate to severe hearing loss are more likely to experience impaired activities of daily living and instrumental activities of daily living compared with those with mild or no hearing loss.[2]

Nominator and Stakeholder Engagement: The nominator was engaged during refinement of the Key Questions. Revisions to the scope of the nomination were made to address potential overlap with the United States Preventive Services Task Force recommendation on screening for hearing loss in older adults. The subsequent scope of the Key Questions focused on the impact of hearing loss interventions on clinical and quality of life outcomes.

The key questions for this nomination are:

KQ1: In older adults with presbycusis, what is the comparative effectiveness and/or harms of medical/surgical interventions, etc. (including combinations of interventions) on clinical outcomes or health care utilization?

- a. Do outcomes vary by patient characteristics, level of impairment, or timing of the intervention?

KQ2: In older adults with presbycusis, what is the comparative effectiveness and/or harms of medical/surgical interventions (including combinations of interventions) on functional and health-related quality-of-life outcomes?

- a. Do outcomes vary by patient characteristics, level of impairment, or timing of the intervention?

To define the inclusion criteria for the key questions we specify the population, interventions, comparators, outcomes, timing, and setting (PICOTS) of interest (Table 1).

Table 1. Key Questions and PICOTS

Key Questions	KQ 1: intervention effectiveness on clinical outcomes	KQ 2: intervention effectiveness on function and health-related QoL
Population	Older adults (50 years or older) with a diagnosis of presbycusis	Older adults (50 years or older) with a diagnosis of presbycusis

Key Questions	KQ 1: intervention effectiveness on clinical outcomes	KQ 2: intervention effectiveness on function and health-related QoL
Interventions	Any treatment/therapy used to help cope with presbycusis including but not limited to: <ul style="list-style-type: none"> • Hearing aids • Assisted listening devices • Cochlear implants • Aural rehabilitation 	Any treatment/therapy used to help cope with presbycusis including but not limited to: <ul style="list-style-type: none"> • Hearing aids • Assisted listening devices • Cochlear implants • Aural rehabilitation
Comparators	Placebo, no treatment, waitlist, treatment as usual, other treatment/interventions	<ul style="list-style-type: none"> • Placebo, no treatment, waitlist, treatment as usual, other treatment/interventions
Outcomes	<ul style="list-style-type: none"> • Overall health • Mental health • Hospitalizations 	<ul style="list-style-type: none"> • Overall quality of life • Hearing-related quality of life
Timing	No restrictions	No restrictions
Setting	Primary care; specialty care	Primary care; specialty care

Abbreviations: KQ=key questions; QoL=quality of life

Methods

We assessed nomination Age-Related Hearing Loss, for priority for a systematic review or other AHRQ EHC report with a hierarchical process using established selection criteria (Appendix A). Assessment of each criteria determined the need for evaluation of the next one.

1. Determine the *appropriateness* of the nominated topic for inclusion in the EHC program.
2. Establish the overall *importance* of a potential topic as representing a health or healthcare issue in the United States.
3. Determine the *desirability of new evidence review* by examining whether a new systematic review or other AHRQ product would be duplicative.
4. Assess the *potential impact* a new systematic review or other AHRQ product.
5. Assess whether the *current state of the evidence* allows for a systematic review or other AHRQ product (feasibility).
6. Determine the *potential value* of a new systematic review or other AHRQ product.

Appropriateness and Importance

We assessed the nomination for appropriateness and importance.

Desirability of New Review/Duplication

We searched for high-quality, completed or in-process evidence reviews published in the last three years on the key questions of the nomination. See Appendix B for sources searched.

Impact of a New Evidence Review

The impact of a new evidence review was qualitatively assessed by analyzing the current standard of care, the existence of potential knowledge gaps, and practice variation. We considered whether it was possible for this review to influence the current state of practice through various dissemination pathways (practice recommendation, clinical guidelines, etc.).

Feasibility of New Evidence Review

We conducted a literature search in PubMed from April 2013 to April 2018. In addition, we searched ClinicalTrials.gov for in-process or recently completed unpublished studies.

We reviewed all identified titles and abstracts for inclusion and classified them by study design, to assess the size and scope of a potential evidence review. Because a small number of articles were identified in the PubMed search, Related Studies for each article were searched in PubMed to identify any potential publications missed in the feasibility search.

See Appendix C for the PubMed search strategy and links to the ClinicalTrials.gov search.

Compilation of Findings

We constructed a table with the selection criteria and our assessments (Appendix A).

Results

Appropriateness and Importance

This is an appropriate and important topic. In population-based studies of community-dwelling older adults (ages 50 years and older), the prevalence of hearing loss ranges from 20 to 40 percent.[1, 3-5] In adults ages 80 years and older, the prevalence increases to over 80 percent.[1]

Desirability of New Review/Duplication

A new evidence review on age-related hearing loss would be partly duplicative of an existing product.

Two systematic reviews were identified that examined outcomes relating to KQ1 (clinical outcomes). One systematic review that examined the impact of hearing aids included an audiologic clinical outcome pertaining to listening ability and also examined the reporting of adverse effects. [10] The other identified review identified studies that examined general health, mental health, and depression symptoms for hearing aid users, as well as auditory performance, low mood, loneliness, and self-esteem in patients receiving a cochlear implant. [11] Parts of KQ1 were not addressed in the identified systematic reviews. No reviews were identified that examined overall health or hospitalizations. Aural rehabilitation and assisted listening devices were not examined in any identified review that included health and mental health outcomes. Since the reviews identified did not address key outcomes (overall health and hospitalization) and did not examine all interventions of interest, the scope of KQ1 assessed for impact and feasibility was not adjusted.

Six systematic reviews addressed KQ2 (overall quality of life and health-related quality of life). Two of the reviews examined the impact of hearing aids and included outcomes on general quality of life, hearing-specific health-related quality of life, and general health-related quality of life. [10, 12] Three of the reviews examined the impact of aural rehabilitation and examined general quality of life, emotional and functional status, self-efficacy, social participation and cognitive function outcomes. [11, 13, 14] The remaining review examined the impact of cochlear implants and included a cognitive functioning outcome. Assisted listening devices other than hearing aids were not examined in any identified review.[15] The identified systematic reviews examining the impact of hearing aids, aural rehabilitation, and cochlear implants were determined to address the scope of KQ2 in regard to these interventions. Therefore, the

following impact and feasibility assessments focused solely on assisted listening devices, which were not assessed in identified systematic reviews.

Findings may be further duplicated by ongoing or completed reviews that have yet to be published. Additional systematic reviews were identified in PROSPERO. One completed but not published review on hearing aids and cochlear implants addressed KQ2.[16] Two ongoing reviews on aural rehabilitation may address KQ1 and KQ2.[17, 18]

One additional systematic review protocol was identified in PubMed that compared alternative listening devices to hearing aids may address KQ1 and KQ2.[19]

See Table 2, Duplication column.

Impact of a New Evidence Review

A new systematic review on the age-related hearing loss may have moderate impact. There is a 2015 practice guideline published by the American Academy of Audiology (AAA) that recommends cochlear implantation for adults with severe to profound hearing-loss.[20] A 2006 AAA guideline recommends the use of an amplification device to meet patient needs, function, and goals.[21] A 2012 recommendation by the American Academy of Family Physicians supported the use of hearing aids, assistive listening devices, and rehabilitation programs.[22] The AFP recommendation also supported the use of surgical implants for selected patients.

While guidelines exist that support the use of hearing loss interventions, estimates of non-use vary from 5% to 40%.[23]

Feasibility of a New Evidence Review

A new evidence review examining age-related hearing loss is not feasible.

We identified one study with potential for inclusion in a systematic review. The cross-sectional study addressing KQ1 examined the impact of hearing aids on audiologic outcomes and HHIE outcomes at four months.[24]

No studies were identified that examined the impact of assisted listening devices on functional and quality of life outcomes.

A search of ClinicalTrials.gov identified nine recruiting, active, or complete studies.

A systematic review is not feasible based on the limited number of identified studies.

See Table 2, Feasibility column.

Table 2. Key Questions and Results for Duplication and Feasibility

Key Question	Duplication (04/2015-04/2018)	Feasibility (04/2013-04/2018)
KQ 1	Total number of identified systematic reviews: 2 <ul style="list-style-type: none"> • Cochrane: 1[10] • Other: 1[11] 	<u>Size/scope of review</u> Relevant Studies Identified: 3 <ul style="list-style-type: none"> ○ Cross-sectional: 2[24] <u>Clinicaltrials.gov</u> <ul style="list-style-type: none"> • Recruiting: 1[25] • Active: 1[26] • Complete: 5[27-31]
KQ 2	Total number of identified systematic reviews: 6 <ul style="list-style-type: none"> • Cochrane: 1[10] • Other: [11-15] 	<u>Size/scope of review</u> Relevant Studies Identified: 0 <u>Clinicaltrials.gov</u> <ul style="list-style-type: none"> • Complete: 1[31]

Abbreviations: KQ=Key Question;

Summary of Findings

- Appropriateness and importance: The topic is both appropriate and important.
- Duplication: A new review would be partly duplicative of an existing product. Six systematic reviews were identified, including one Cochrane review. Two reviews were relevant to KQ 1 and six to KQ 2. These reviews did not cover the full range of interventions in the nomination scope. The identified reviews did not assess aural rehabilitation and assisted listening devices for KQ 1 and did not examine assisted listening devices for KQ 2. These reviews also did not cover the range of outcomes: overall health and hospitalizations for KQ 1. Three unpublished reviews with either an in-progress or completed status were identified in PROSPERO and one additional systematic review was identified in PubMed. While findings may be further duplicated should the findings of these reviews be published, it is unclear based on the information available on these trials whether they will address the areas not addressed in published systematic reviews.
- Impact: A new systematic review on the age-related hearing loss may have moderate impact. Clinical practice guidelines exist that provide recommendations on appropriate interventions in age-related hearing loss, yet utilization remains at sub-optimal levels.
- Feasibility: A new review is not feasible. A systematic review is not feasible based on the limited number of identified studies.

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26. *Effects of Cognitive Training on Speech Perception*. <https://clinicaltrials.gov/ct2/show/NCT02294812>.
27. *Efficacy and Safety of AUT00063 Versus Placebo in Age-Related Hearing Loss*. <https://clinicaltrials.gov/ct2/show/NCT02345031>.
28. *Computer-Based Auditory Rehabilitation*. <https://clinicaltrials.gov/ct2/show/NCT02147847>.
29. *Variability In Hearing Aid Outcomes In Older Adults*. <https://clinicaltrials.gov/ct2/show/NCT02448706>.
30. *At-home Auditory Training Clinical Trial*. <https://clinicaltrials.gov/ct2/show/NCT01950013>.
31. *The Baltimore HEARS Pilot Study*. <https://clinicaltrials.gov/ct2/show/NCT02045511>

Appendix A. Selection Criteria Summary

Selection Criteria	Assessment
1. Appropriateness	
1a. Does the nomination represent a health care drug, intervention, device, technology, or health care system/setting available (or soon to be available) in the U.S.?	Yes
1b. Is the nomination a request for a systematic review?	Yes
1c. Is the focus on effectiveness or comparative effectiveness?	Yes
1d. Is the nomination focus supported by a logic model or biologic plausibility? Is it consistent or coherent with what is known about the topic?	Yes
2. Importance	
2a. Represents a significant disease burden; large proportion of the population	Prevalence of hearing loss ranges from 20 to 40 percent.[1, 3-5] In adults ages 80 years and older, the prevalence increases to over 80 percent.[1]
2b. Is of high public interest; affects health care decision making, outcomes, or costs for a large proportion of the US population or for a vulnerable population	Yes, affects health and quality of life outcomes for a large proportion of older adults in the US.
2c. Represents important uncertainty for decision makers	Yes
2d. Incorporates issues around both clinical benefits and potential clinical harms	Yes
2e. Represents high costs due to common use, high unit costs, or high associated costs to consumers, to patients, to health care systems, or to payers	Yes, represents high cost due to high prevalence of age-related hearing loss
3. Desirability of a New Evidence Review/Duplication	
3. Would not be redundant (i.e., the proposed topic is not already covered by available or soon-to-be available high-quality systematic review by AHRQ or others)	Yes, partly duplicative. Six systematic reviews were identified, including one Cochrane review. Outcomes of interest in KQ1 that were not included in the identified systematic reviews were overall health and hospitalizations. Aural rehabilitation and assisted listening devices were not examined in systematic reviews relating to KQ1. Six systematic reviews were identified that addressed KQ2. Assisted listening devices were not examined in any of the identified completed reviews. Findings may be further duplicated by four identified in-progress or completed, but not published systematic reviews.
4. Impact of a New Evidence Review	
4a. Is the standard of care unclear (guidelines not available or guidelines inconsistent, indicating an information gap that may be addressed by a new evidence review)?	No, guidelines are available and consistent

Selection Criteria	Assessment
4b. Is there practice variation (guideline inconsistent with current practice, indicating a potential implementation gap and not best addressed by a new evidence review)?	Yes, there is a considerable practice gap and lack of utilization of hearing loss interventions.
5. Primary Research	
5. Effectively utilizes existing research and knowledge by considering: - Adequacy (type and volume) of research for conducting a systematic review - Newly available evidence (particularly for updates or new technologies)	A new review is not feasible. The feasibility search and a review of titles and abstracts identified five potential articles published in the past five years. There was considerable heterogeneity between these five studies in terms of interventions and outcomes.

Abbreviations: AHRQ=Agency for Healthcare Research and Quality; KQ=Key Question

Appendix B. Search for Evidence Reviews (Duplication)

Listed are the sources searched.

Search date: April 18, 2013 to April 18, 2018
AHRQ: Evidence reports and technology assessments, USPSTF recommendations
VA Products: PBM, and HSR&D (ESP) publications, and VA/DoD EBCPG Program
Cochrane Systematic Reviews and Protocols http://www.cochranelibrary.com/
PubMed
PubMed Health http://www.ncbi.nlm.nih.gov/pubmedhealth/
HTA (CRD database): Health Technology Assessments http://www.crd.york.ac.uk/crdweb/
PROSPERO Database (international prospective register of systematic reviews and protocols) http://www.crd.york.ac.uk/prospero/
CADTH (Canadian Agency for Drugs and Technologies in Health) https://www.cadth.ca/
DoPHER (Database of promoting health effectiveness reviews) http://eppi.ioe.ac.uk/webdatabases4/Intro.aspx?ID=9
ECRI institute https://www.ecri.org/Pages/default.aspx
PsycINFO (Ovid)
Secondary Sources checked on an as needed basis
Campbell Collaboration http://www.campbellcollaboration.org/
McMaster Health System Evidence https://www.healthsystemsevidence.org/
Robert Wood Johnson http://www.rwjf.org/
Systematic Reviews (Journal) : protocols and reviews http://systematicreviewsjournal.biomedcentral.com/
UBC Centre for Health Services and Policy Research http://chspr.ubc.ca/
WHO Health Evidence Network http://www.euro.who.int/en/data-and-evidence/evidence-informed-policy-making/health-evidence-network-hen
CINAHL (EBSCO)

Appendix C. Search Strategy & Results (Feasibility)

Topic: Comparative Effectiveness of Therapy for Presbycusis April 18, 2018 Database Searched: MEDLINE(PubMed)	
Concept	Search String
Therapy for Presbycusis	(((((("age related hearing loss"[Title/Abstract]) OR "Presbycusis"[Mesh])) AND (("Hearing Aids"[Mesh]) OR "Correction of Hearing Impairment"[Mesh])))) OR "Presbycusis/therapy"[Mesh])
NOT	
Not Editorials, etc.	(((((("Letter"[Publication Type]) OR "News"[Publication Type]) OR "Patient Education Handout"[Publication Type]) OR "Comment"[Publication Type]) OR "Editorial"[Publication Type]) OR "Newspaper Article"[Publication Type])
AND	
Limit to last 5 years ; human ; English	Filters activated: published in the last 5 years, Humans, English.
Systematic Review N=5	PubMed subsection "Systematic [sb]"
https://www.ncbi.nlm.nih.gov/sites/myncbi/r.relevo.1/collections/54780459/public/	
Randomized Controlled Trials N=8	Cochrane Sensitive Search Strategy for RCT's "(((((((groups[tiab]) OR (trial[tiab]) OR (randomly[tiab]) OR (drug therapy[sh]) OR (placebo[tiab]) OR (randomized[tiab]) OR (controlled clinical trial[pt]) OR (randomized controlled trial[pt]))))
https://www.ncbi.nlm.nih.gov/sites/myncbi/r.relevo.1/collections/54780477/public/	
Other N=22	
https://www.ncbi.nlm.nih.gov/sites/myncbi/r.relevo.1/collections/54780491/public/	

Clinicaltrials.gov

9 Studies found for: Recruiting, Active, not recruiting, Completed Studies | Presbycusis | Senior | Start date from 04/18/2013 to 04/18/2018

https://clinicaltrials.gov/ct2/results?cond=Presbycusis&term=&type=&rslt=&recrs=a&recrs=d&recrs=e&age_v=&age=2&gndr=&intr=&titles=&outc=&spons=&lead=&id=&cntry=&state=&city=&dist=&locn=&strd_s=04%2F18%2F2013&strd_e=04%2F18%2F2018&prcd_s=&prcd_e=&sfpd_s=&sfpd_e=&lupd_s=&lupd_e=