UK National Screening Committee

Screening for Hearing Loss in older adults

19 November 2015

Aim

1. To ask the UK National Screening Committee to make a recommendation, based upon the evidence presented in this document, whether or not screening for hearing loss in older adults meets the NSC criteria to support the introduction of a population screening programme.

   This document provides background on the item addressing screening for adult hearing loss.

Current recommendation

2. The 2009 review of screening for hearing loss in adults concluded that there is insufficient evidence to warrant a screening programme.

   This was due to uncertainty on the level of hearing loss to be detected, the frequency of testing, the screening test and the absence of Randomised Control Trial (RCT) evidence in the literature.

   This was informed by a 2007 HTA study of potential screening tests and models. Based on its findings, the study recommended an RCT of screening to detect hearing loss at least 35 dB in people age 55 – 74, further research into i) screening devices, ii) the provision of hearing aids in a primary care setting and iii) other aspects related to the introduction of screening.

Review

3. This update review has been undertaken by Dr J Spiby, to advise the UK NSC whether the evidence published between 2009 and 2014 suggests that a change to the current recommendation is required. The scope of this review focused on the test, the treatment and whether RCTs of screening which might inform decision making have been undertaken.

4. The conclusion of this review is that hearing loss in adults is a major health problem with significant impact however due to the limited evidence available a screening programme cannot be introduced for the following reasons;

    a. <u>The test</u>**;** Systematic reviews suggests that the volume of evidence is too limited to establish an optimum approach to screening in terms of the type of test to be used, the severity of hearing loss to target, the age of the population to be screened, the frequency of screening and where screening should be undertaken. **Criterion 5 is not met**

    b. <u>The treatment</u>; Despite the high prevalence of hearing loss and many options for amplification, a significant proportion of those with hearing loss do not use hearing aids for any length of time. Systematic reviews report a lack of evidence on outcomes from long term use of hearing aids and on the effectiveness of additional interventions aimed at improving the duration of hearing aid use. **Criterion 12 is not met**

    c. <u>The Screening Programme</u>; there remains an absence of RCTs of screening in the general population. Screening has not been shown to provide any hearing related improvement in quality of life in comparison to hearing loss identified in other ways. The HTA review from 2007 suggested that a large scale Randomised controlled Trial (RCT) of screening for hearing impairment35 dB hearing impairment or poorer should be undertaken within the 55 – 74 age group. **Criterion 13 is not met**

Consultation

5. A three month consultation was hosted on the UK NSC website. Communication of the consultation was promoted through both PHE Events and the PHE Screening Twitter platform. Direct emails were sent to stakeholders of whom 17 organisations were contacted directly. Annex A

    Nine responses were received from the following stakeholders: Action on Hearing Loss, British Academy of Audiology, British Association of Audiovestibular Physicians, British Society of Audiology, Independent Age, International Longevity Centre, National Community

Hearing Association, Screening for Life Coalition and Hearing Loss and Deafness Alliance. A further 23 organisations submitted their comments to the public consultation without direct contact from the UK NSC. Annex B

6. A range of views on the overall recommendation were submitted. Six responses disagreed with the recommendation, two agreed with the recommendation and one response made no direct comment on the recommendation but suggested that the available evidence was sufficient to justify an RCT of screening.

Most respondents considered the body of literature within the review (2009 – 2012) to be too narrow. However a limited update covered papers published between 2012 – 2014. Respondents submitted a number of papers published between 1984 and 2015 for consideration. These are attached and have been organised by dates within, before and after the searches undertaken for this review. Papers within the search dates were considered by the reviewer. Annex C

The main themes of the responses were:

- that the health impact of hearing loss had been defined too narrowly and therefore the potential impact of a screening programme was similarly limited. A significant number of the submitted publications related to this issue and discussed a wider range of adverse outcomes related to hearing loss. These included dementia, depression and social isolation. However the review acknowledges that hearing loss is a major public health problem and the spectrum of health outcomes was not the main focus of the review. The submitted papers were summarised in a detailed submission from the British Society of Audiology which reported them to be conflicting in terms of the association with hearing loss and the impact of hearing related interventions. In addition, an ongoing systematic relating to hearing loss, cognitive decline and dementia is due to report in 2016. This may help clarify some of the issues relating to this issue and can be addressed in the next review.
- that papers relating to the test had been missed. One of the papers within the search dates had already been included in the review (Davis 2012). The other paper (Watson 2012) was excluded as it was a small study of 90 participants in a population which was not representative of a general screening population. In addition the paper reported test values in keeping with those already reported in the review.

- the problem of non compliance in the use of hearing aids was acknowledged as an issue in some responses but the range of 25% - 40% was considered too high. A recent systematic review (Barker 2014) reported a range of 5% - 40%. This more recent paper was already included in the review. The review has been updated to reflect the estimate more explicitly. However all estimates of non compliance appear subject to uncertainty. This is because of a number of methodological problems highlighted in systematic reviews submitted by respondents (Barker 2014, Perez 2012, Chou 2011) and included in the review. These papers emphasise the lack of high quality evidence regarding the value of interventions to improve uptake and continued use of hearing aids.
- a number of responses discussed the issue of capacity to support a screening and management pathway. It was generally acknowledged that universal screening would increase the number of referrals for further evaluation and intervention. Several responses suggested this would be challenging. The discussion focused on the extent to which recent reforms had been implemented and whether this represented an adequate infrastructure for screening. A number of non peer reviewed reports, guidelines, policy documentation and service delivery planning documents were referenced in the responses. While these provide useful context it is difficult to quantify the impact of recent developments in the pathway from them. In keeping with this, the responses' estimates of the 'state of readiness' varied. One estimated that about 50% of areas had taken steps to significantly improve the pathway. This response was concerned that if the debate remained focused on screening it may detract from more immediately achievable improvement in the detection and onward management of hearing loss.

Recommendation

7. The committee is asked to approve the following recommendation:

A systematic population screening programme of hearing loss in older adults is not recommended.

Hearing loss in older adults is a serious public health problem. The evidence is too limited to establish the type of screening test to be used, the severity of hearing loss to target, the age of the population to be screened, the frequency of screening. The effectiveness of the long term use of hearing aids and on the effectiveness of additional interventions aimed at improving the duration of hearing aid use is also uncertain.

There remains an absence of RCT evidence demonstrating that screen detected hearing loss results in better outcomes compared with hearing loss detected through usual care.

Based upon the UK NSC criteria to recommend a population screening programme, evidence was appraised against the following criteria:

Criteria		Met / Not met
The Condition		
1	The condition should be an important health problem.	Met ✓
The Test		
5	There should be a simple, safe, precise and validated screening test.	Not met ✗
The Screening Programme		
13	There should be evidence from high quality Randomised Controlled Trials that the screening programme is effective in reducing mortality or morbidity.	Not met ✗

Annex A

List of organisations contacted:

1. Action on Hearing Loss
2. Age UK
3. British Academy of Audiology
4. British Geriatrics Society
5. British Society of Audiology
6. British Society of Hearing Aid Audiologists
7. Deafness Research UK
8. The Ear Foundation
9. Faculty of Public Health
10. Hearing Link
11. HEARING
12. Hidden Hearing
13. National Community Hearing Association
14. Royal College of General Practitioners
15. Royal College of Physicians
16. Screening for Life Coalition
17. Signature

Annex B

List of organisations who submitted a response without prior contact from the NSC Evidence Team:

1. *Action on Hearing Loss*
2. *Action for Deafness*
3. *Action Deafness*
4. *British Hearing Aid Manufacturers Association*
5. *British Academy of Audiology*
6. *British Society of Hearing Aid Audiologists*
7. *British Association of Teachers of the Deaf*
8. *British Society of Audiology*
9. *British Tinnitus Association*
10. *Cambridgeshire Hearing Help*
11. *Cochlear Implanted Children's Support Group*
12. *Ear Foundation*
13. *Exeter Academy*
14. *Hearing Dogs*
15. *Hearing Link*
16. *National Association of Deafened People*
17. *National Cochlear Implant Users Group*
18. *Royal Association for Deaf People*
19. *SENSE*
20. *SignHealth*
21. *SONUS*
22. *Signature*
23. *UK Council On Deafness (UKCOD)*

Papers submitted within the review search dates

Annex C

Already included in the review	
Davis et al (2012) Diagnosing patients with age-related hearing loss and tinnitus: supporting GP clinical engagement through innovation and pathway redesign in audiology services, *International Journal of Otolaryngology*	
Morris A E et al. An economic evaluation of screening 60 to 70-year old adults for hearing loss. Journal of Public Health. 2012; 35(1):139-146	
Barker et al (2014) Interventions to improve hearing aid use in adult auditory rehabilitation, *Cochrane Database of Systematic Reviews* 7, CD010342;	
Yueh et al (2010) Long-term effectiveness of screening for hearing loss: the screening for auditory impairment--which hearing assessment test (SAI-WHAT) randomized trial. *Journal of the American Geriatrics Society*, 58(3), 427-34;	
Accepted for inclusion	
Gurgel et al (2014) Relationship of hearing loss and dementia: a prospective, population-based study. *Otology & Neurotology* 35(5), 775-81	
Perez and Edmonds (2012) A systematic review of studies measuring and reporting hearing aid usage in older adults since 1999: a descriptive summary of measurement tools, *PLoS ONE* 7(3), e31831.	

Considered but not accepted	**Reviewer comment**
Watson (2012) Telephone screening tests for functionally impaired hearing: current use in seven countries and development of a US version. *Journal of the American Academy of Audiology* 23, 757-767.	Small study of 90 participants in an unrepresentative population. Reported test values in keeping with those in the USPSTF systematic review.
Swan IR, Guy FH, Akeroyd MA. Health-related quality of life before and after management in adults referred to otolaryngology: a prospective national study. Clin Otolaryngol. Feb 2012; 37(1): 35-43	A study of quality of life in 15 diagnoses referred to otolaryngology clinics. Reports overall positive outcomes for hearing aid use in a population of 534 receiving hearing aids for a range of diagnoses. However less than significant improvement or negative effect was reported in 45% of cases.

	A lack of clarity on population generalisability was the main obstacle to inclusion.
Metselaar M, et al. Self-reported disability and handicap after hearing-aid fitting and benefit of hearing aids: comparison of fitting procedures, degree of hearing loss, experience with hearing aids and uni- and bilateral fittings. Eur Arch Otorhinolaryngol. 2009; 266:907–917	Submitted as example of type of study that is common in hearing aid use. Not a request to include. Dutch study concluding that fitting techniques are associated with improvement in hearing disability but have no impact on incidence of depression in those with hearing disability.
Gilliver and Hickson (2011) Medical practitioners' attitudes to hearing rehabilitation. *International Journal of Audiology* 50(12), 850-856	Approaches to rehabilitation addressed in the Cochrane review (Barker)
Mondelli and Souza (2012) Quality of life in elderly adults before and after hearing aid fitting. *Revista Brasileira de Otorrinolaringologia* 78(3), 49-56.	A study with a limited (3 month) follow up period which does not address the issue of long term use of hearing aids identified in systematic reviews.
Lotfi et al (2009) Quality of life improvement in hearing-impaired elderly people after wearing a hearing aid. *Archives of Iranian Medicine* 12(4), 365-70.	A study with a limited (3 month) follow up period which does not address the issue of long term use of hearing aids identified in systematic reviews.
Mizutari et al (2013) Age-related hearing loss and the factors determining continued usage of hearing aids among elderly community-dwelling residents. *PLoS One* 8(9), e73622.	Study covering same area as Cochrane systematic review. Population size (65 included in the analysis – unlikely to significantly change outcomes of Cochrane review) an obstacle to inclusion in this review.
Leighton et al (2013) Evaluation of interactive video tutorials to educate first-time hearing aid users, *The European Journal of Public Health* 23 (1);	A small RCT of 200 first time HA users, reported that the intervention group use hearing aids 2 hours more / day than standard care.
Zapala, D. A. et al 2010. Safety of Audiology Direct Access for Medicare Patients Complaining in Impaired Hearing. *Journal of the American Academy of Audiology*, 21(6), pp. 365-379.	Retrospective case review of 1550 referred patients, reports that people seeking help for hearing problems can be managed by audiologists to the same standard as that provided by otolaryngologists. The issue addressed by the paper was not the main focus of the study.
Stevens, G., et al. (2011) Global and regional hearing impairment prevalence: an analysis of 42 studies in 29 countries. European Journal of Public Health, pp. 1-7;	Study of global prevalence which does not provide a rate for the UK specifically or Western Europe just high income countries split by male and female >15 years of age.

Hind et al. 2011. Prevalence of clinical referrals having hearing thresholds within normal limits. International Journal of Audiology 2011; 50: 708–716;	Not a study in a screened population.
Submitted papers addressing health outcomes relating to hearing loss	

Lin F, et al. Hearing Loss and Cognitive Decline in Older Adults. JAMA Intern. Med. 2013; 173: 293-99	
Lin F, et al. Hearing loss and incident dementia. *Archives of Neurology*, 2011; 68(2):214-220	
Gopinath et al (2012) Hearing-impaired adults are at increased risk of experiencing emotional distress and social engagement restrictions five years later. *Age and Ageing* 41(5), 618–62	
Saito et al (2010) Hearing handicap predicts the development of depressive symptoms after three years in older community-dwelling Japanese. *Journal of the American Geriatrics Society* 58(1), 93-7	
Pronk et al (2011) Prospective effects of hearing status on loneliness and depression in older persons: identification of subgroups. *International Journal of Audiology* 50(12), 887-96.	
Genther et al (2013) Association of hearing loss with hospitalization and burden of disease in older adults. *Journal of the American Medical Association* 309(22), 2322;	
Lin et al (2013) Hearing loss and cognitive decline in older adults. *Internal Medicine* 173(4), 293-299;	
Helvik, A. 2012. Hearing loss and risk of early retirement. The Hunt study. *European Journal of Public Health,* 23(4), pp. 617-622;	
Lin and Ferrucci (2012) Hearing loss and falls among older adults in the United States. *Archives of Internal Medicine* 172(4), 369-371;	
Viljanen et al (2009) Hearing as a predictor of falls and postural balance in older female twins. *The Journals of Gerontology Series A: Biological Sciences and Medical Sciences* 64(2), 312-7.	
Gopinath et al (2009) Association between age-related hearing loss and stroke in an older population. *Stroke* 40(4), 1496–1498.	
Helzner et al (2011) Hearing sensitivity in older adults: associations with cardiovascular risk factors in the health, aging and body composition study. *Journal of the American Geriatric Society*, 59 (6), 972-9;	
Chasens et al (2010) Reducing a barrier to diabetes education: identifying hearing loss in patients with diabetes. *Diabetes Education* 36(6), 956-64.	
Mitchell et al (2009) Relationship of Type 2 diabetes to the prevalence, incidence and progression of age-related hearing loss. *Diabetic Medicine* 26(5), 483-8;	

Karpa et al (2010) Associations between hearing impairment and mortality risk in older persons: the Blue Mountains Hearing Study. *Annals of Epidemiology* 20(6), 452-9.	
McKee et al (2011) Perceptions of cardiovascular health in an underserved community of deaf adults using American Sign Language. Disability and Health 4(3), 192-197;	
Acar et al (2011) Effects of hearing aids on cognitive functions and depressive signs in elderly people. *Archives of Gerontology and Geriatrics*, 52(3), 250-2;	
Hidalgo, J. L. et al. 2009. Functional status of elderly people with hearing loss. *Archives of Gerontology and Geriatrics,* 49(1), pp. 88-92;	
Lin, F. R. et al. 2011 Hearing loss and cognition in the Baltimore Longitudinal Study of Aging. *Neuropsychology*. 2011; 25(6):763-770;	
Cacioppo JT, Hawkley LC, Norman GJ, Berntson GG. Social isolation. *Ann N Y Acad Sci*. 2011;1231:17-22;	
Grey literature, reports, guidance, policy and opinion documents	
Action on Hearing Loss (2011) Hearing Matters, London: Action on Hearing Loss.	
The Scottish Government (2014) See hear: a strategic framework for meeting the needs of people with a sensory impairment in Scotland, Edinburgh: Scottish Government	
Echalier (2010) In it together – the impact of hearing loss on personal relationships, London: Action on Hearing Loss.	
The Ear Foundation (2014) The Real Cost of Adult Hearing Loss: Reducing its impact by increasing access to the latest hearing technologies. Nottingham: The Ear Foundation	
Action on Hearing Loss / DCAL (2013) Joining up, London: Action on Hearing Loss	
Arrowsmith (2014) Hidden disadvantage: why people with hearing loss are still losing out at work. London: Action on Hearing Loss.	
International Longevity Centre (ILC) UK (2013) Commission on hearing loss: final report, London: ILC-UK.	
Action on Hearing Loss / London Economics (2010) Cost benefit analysis of hearing screening for older people	
Eurotrak data (2012).	
Department of Health (2012) Adult hearing AQP implementation pack, London: Department of Health	
Public Health England (2013) NHS Atlas of Variation in Diagnostic Services: reducing unwarranted variation to increase value and improve quality, London: Public Health England	
best practice guidance from the British Society of Audiology	

Ringham (2013) Not just lip service, London: Action on Hearing Loss	
NHS Improvement, 2010. *Audiology Improvement Programme: Pushing the boundaries: Evidence to support the delivery of good practice in audiology.* Leicester: NHS Improvement;	
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Department of Health, 2010. Extension of Any Qualified Provider, Impact Assessment	
Matthews, L. (2011) "Seen but not heard: People with hearing loss are not receiving the support they need". London, RNID	
NICE. Guide to the methods of technology appraisal. 2013	
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BAA Guidelines for Referral to Audiology of Adults with Hearing Difficulty (2009).	
BSHAA Guidance on Professional Practice for Hearing Aid Audiologists (2014	
Department of Health, 2012, Best Practice Guidance, AQP Implementation Pack Adult Hearing Services	
NICE, 2013. Mental wellbeing of older people in care homes. NICE Quality Standard 50. pp. 28-31	
Bainbridge K and Wallhagen M. Hearing Loss in an Aging American Population: Extent, Impact, and Management. Annu Rev Public Health. 2014; 35:139–52	
Davis, A. and Smith, P., 2013. Adult Hearing Screening: Health Policy Issues – What Happens Next? *American Journal of Audiology*, 22(1), pp. 167-170	
NHS England, 2014. Five Year Forward View. NHS England, London	
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Lin FR. 2014, Hearing Loss and Healthy Aging: Workshop Summary. Washington, D.C.: National Academies Press;	

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Davis et al (2007) Acceptability, benefit and costs of early screening for hearing disability: a study of potential screening tests and models, *Health Technology Assessment* 11(42

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18. Ecob R, et al. Is the relationship of social class to change in hearing threshold levels from childhood to middle age explained by noise, smoking, and drinking behaviour? International Journal of Audiology. 2008. 47: 100-108

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