

# Alternative listening devices: reaching the places hearing aids don't

BY DAVID MAIDMENT

The stigma surrounding hearing aids means that many people who would benefit from wearing them are put off from doing so. Alternative listening devices could provide the solution to this. **David Maidment** discusses these devices, their effectiveness and the impact on audiological services

In the UK, two out of three people that could benefit from using hearing aids do not access them, and of those who do, up to 40% do not wear them [1]. Low hearing aid use is not just seen in the UK, where the provision of hearing aids is free via the National Health Service (NHS), but also in other healthcare systems globally, including the USA [2] and Australia [3]. Stigma associated with hearing loss and hearing aids has been identified as one of the leading barriers that prevents people seeking amplification [4]. People with hearing loss are often concerned or embarrassed that hearing aids will make them look old, or that they will be treated differently if they wear them [5]. This is problematic because untreated hearing loss not only results in continued communication difficulties, but can also increase the risk of developing other health conditions, including anxiety, depression, and dementia [6]. There is, therefore, a need to assess new service delivery models for people with hearing loss that do not accept or cannot access hearing aids.

Advances in technology have led to a rapid increase in innovative alternative listening devices to conventional hearing aids. Alternative listening devices provide similar functionality to hearing aids, in terms of the amplification of sound. These alternatives include hearing devices that can be linked to smartphones or tablet computers, as well as smartphone apps that allow the user's mobile phone to act as a hearing aid when paired with wireless earphones. Novel to all of these devices is that they allow users to conveniently adjust their device settings to their preferred sound levels at a time that suits the user. Although alternative listening devices require limited input from a trained audiologist, they have the potential to maximise patient choice, self-management,

accessibility and acceptability.

The US National Academies of Sciences, Engineering and Medicine released a report in June 2016 outlining 12 recommendations for improving access and affordability of hearing healthcare for adults with hearing loss in the USA. Crucially, one of their recommendations included the implementation of a new US Food and Drug Administration (FDA) device category for over-the-counter wearable hearing devices, and in December 2016 the FDA announced its commitment to consider creating a category of over-the-counter hearing devices. Nevertheless, one crucial piece of the puzzle that is currently missing is a sufficient evidence-base assessing the effectiveness of alternative listening devices. The need for high-quality evidence (i.e. randomised controlled trials) in hearing has been highlighted in the NHS, England and the Department of Health's Action Plan for Hearing loss (2015), and the recently published Commissioning Services for

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People with Hearing Loss: A Framework for Clinical Commissioning Groups (2016).

To begin to address this evidence gap, we recently completed the first registered systematic review of effectiveness of alternative listening devices compared to conventional hearing aids. While alternatives were found to improve primary outcomes relative to hearing aids (e.g. speech intelligibility and hearing-specific quality of life), the evidence was judged to be low in terms of quality and subject to bias [7]. This review complements two further reviews: 1. a Cochrane review assessing the effectiveness of hearing aids in people with mild-to-moderate hearing loss [8]; and 2. a global NIHR Horizon Scanning Research and Intelligence Centre review on new and emerging technologies for hearing loss. Together, all three reviews will provide up-to-date evidence-base for the effectiveness of a wide range of listening devices for people with hearing loss.

In addition we are currently assessing the perspectives of adults with mild-to-moderate hearing loss with regards to usability, delivery, accessibility, acceptability and adherence of alternative listening devices. After using an alternative device in everyday situations for a period of two weeks, we are assessing the experiences of people with hearing loss in terms of device usability using semi-structured interviews. The interview schedule will be analysed using the COM-B model [9], a contemporary framework in health psychology that can be used to evaluate changes in behaviour resulting from complex healthcare interventions. As buy-in from professionals is also important, we have completed discussion groups with NHS audiologists to ascertain clinicians’ opinions of alternative listening devices and their impact on audiological services. Preliminary analysis suggests that the clinicians interviewed were positive about the benefits that alternatives could provide in terms of self-management, but were also mindful that devices need to be supplemented with additional high-quality information, rehabilitation and support..

Indeed, it is becoming increasingly recognised that device fitting alone is not an optimum intervention to address all the difficulties associated with hearing loss, and that the delivery of audiological

rehabilitation using the internet may be a step in addressing accessibility barriers. For example, C2Hear Online, a multimedia educational programme has been shown to be an effective means of improving knowledge and skills of hearing aids, hearing loss and communication, leading to enhanced hearing aid use in suboptimal users [10]. We plan to build on this concept to assess whether a similar multimedia intervention can also improve use and benefit of alternative listening devices.

All of this preliminary work lays the foundation for a feasibility study of alternative listening devices, which is necessary to estimate important parameters prior to completing a full-scale evaluation. This systematic approach of completing a feasibility study followed by full-scale evaluation is strongly advocated by the UK Medical Research Council’s guidelines for evaluating complex healthcare interventions, to ensure that any uncertainties are addressed and that interventions operate as intended. In the longer term, this body of evidence has the potential to guide commissioners and policy makers when considering new service delivery models that could benefit people with hearing loss that do not or cannot access hearing aids.

## ACKNOWLEDGEMENTS

Many thanks to Mel Ferguson, in addition to Nottingham Hearing Biomedical Research Unit researchers Alex Barker and Eithne Heffernan, and Jun Xia (Systematic Review Solutions Ltd), for their contributions to the various aspects of the reported research. This article presents independent research funded by the National Institute for Health Research (NIHR). The views expressed are those of the authors and not necessarily those of the NHS, the NIHR or the UK Department of Health.

## References

1. Barker F, Mackenzie E, Elliott L, et al. Interventions to Improve Hearing Aid Use in Adult Auditory Rehabilitation. *The Cochrane Library* 2016.
2. Chien W, Lin FR. Prevalence of Hearing Aid Use Among Older Adults in the United States. *Archives of Internal Medicine* 2012;**172**(3):292-3.
3. Gopinath B, Schneider J, Hartley D, et al. Incidence and predictors of hearing aid use and ownership among older adults with hearing loss. *Annals of Epidemiology* 2011;**21**(7):497-506.
4. Barker A, Leighton P, Ferguson M. Coping together with hearing loss: A qualitative meta-synthesis of the psychosocial experiences of people with hearing loss and their communication partner. *International Journal of Audiology*. In press.
5. Wallhagen MI. The Stigma of Hearing Loss. *The Gerontologist* 2010;**50**(1):66-75.
6. Genther DJ, Betz J, Pratt S, et al. Association of hearing impairment and mortality in older adults. *The Journals of Gerontology Series A: Biological Sciences and Medical Sciences* 2015;**70**(1):85-90.
7. Maidment DW, Barker AB, Jun X, Ferguson MA. The effectiveness of alternative listening devices to conventional hearing aids for adults with hearing loss: a systematic review protocol. *BMJ Open* 2016;**6**:e011683.
8. Ferguson M, Kitterick PT, Edmondson-Jones AM, Hoare D. Hearing aids for mild to moderate hearing loss in adults (Protocol). *The Cochrane Library* 2015
9. Michie S, van Stralen MM, West R. The behaviour change wheel: A new method for characterising and designing behaviour change interventions. *Implementation Science*. 2011;**6**(1):42.
10. Ferguson MA, Brandreth M, Leighton P, et al. A randomized controlled trial to evaluate the benefits of a multimedia educational programme for first-time hearing aid users. *Ear and Hearing*. 2016;**37**(2):123-36.

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**Declaration of competing interests:**  
None declared.