

# Adult hearing screening: consideration for a holistic model

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## Background

Adult-onset hearing impairment is a highly prevalent and undertreated chronic problem that poses a significant burden of disease worldwide [1]. It is usually gradual and diagnosed and managed approximately 10 years after adults have first experienced hearing difficulties [2]. Several studies indicate high levels of unmet need for hearing health services and poor use of prescribed hearing aids and evidence shows that the later hearing rehabilitation occurs, the less likely older adults are to continuously use and derive benefits from hearing aids [3]. Further, by this time, hearing impairment is often associated with multiple negative consequences such as reduced employment, poor quality of life, social isolation, depressive symptoms and increased mortality risk. Hearing loss is also independently associated with accelerated cognitive decline, incident cognitive impairment and dementia [4, 5], factors which have provided recent and significant media attention towards hearing loss. Age-related hearing loss affects the individual, their family and friends, and increases reliance on community and informal supports. Therefore it is important to consider the need for a population-based or targeted adult hearing screening programme to raise individuals' awareness of hearing problems and impacts, and to motivate them towards help-seeking earlier. This will maximise the benefits of remediation, so that solutions offered are timely and cost-effective. There are two main factors which need to be considered: (i) which type of hearing screening programme

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will be most sensitive and cost-effective at identifying individuals with a hearing problem and (ii) whether the solutions or interventions are accessible, beneficial and satisfactory to the individual.

## Hearing screening programmes

Many hearing screening programmes for older adults are aimed at evaluating hearing disability, rather than impairment per se. It is assumed that the handicapping effects of the hearing impairment are assumed to be the primary motivator for individuals to seek help, rather than the magnitude of the loss, and this is the primary goal of hearing rehabilitation. Indeed, the majority of older individuals with a hearing loss have hearing thresholds within a mild-to-moderate range where there seems to be the greatest variability between pure tone average thresholds and benefit and use of hearing aids. Considering the framework for intervention and treatment of the International Classification of Functioning Disability and Health model, which separates the measurable impairment from its impact – activity limitations (such as inability to comprehend speech in noisy environments) and participation restrictions (such as the ability to fully participate in communication and conversational activities) – hearing disability is often quantified using speech-in-noise tests (such as digits, words or sentences in multi-talker babble), or hearing handicap questionnaires.

We have previously advocated for a general practitioner (GP)-based model of screening for hearing disability in Australia [6] using a questionnaire-based method of identification, which could be incorporated into the current government-funded hearing healthcare model for older adults. Alternatively, it could be included within the Australian Medicare-funded health assessment for individuals aged 75 and older, promoting identification and management of chronic health problems. However early identification of hearing impairment

from a younger age group would be beneficial for minimising the likelihood of early retirement from hearing-related problems and maximising rehabilitation success. Certainly a study using GP-based case-finding which targeted individuals between 50–65 years showed that effective hearing aid use can be at least tripled [7]. Specifically, the first posting of hearing disability questionnaires detected 78% of individuals prepared to accept hearing aids for the first time, and the possession of hearing aids rose from 7% (at baseline) to 24% (post-intervention). Six months later the hearing aids were being used regularly.

Population-based methods of hearing screening, such as telephone screening tests have been implemented in a number of countries, with varying degrees of success. Certainly in Australia, the follow-up rate of individuals who failed the Telscreen was only 36% [8]. Recently, we utilised a targeted hearing screening approach within a low vision clinic to identify individuals with dual sensory impairment, which leads to poorer quality of life and increased mortality risk than for either single sensory loss alone [9, 10]. We have used a 'Hearing Screening & Education Model' (HSEM) to identify individuals with any measurable hearing loss rather than disability (using a very conservative referral criteria of two of more frequencies with hearing thresholds >20dB) or unmet hearing needs (i.e. owns hearing aids but reports low use or no use) and motivate them to take action. Of 300 individuals assessed, 210 (70%) met the conservative refer criteria and 169 (80% of these) returned for follow-up interviews and questionnaires [10]. The outcomes of this study showed that of the follow-up group, 40% sought help for their hearing needs and hearing aids were recommended for 54% of these (of which the majority obtained hearing aids). The main reasons reported for those who did not seek help were the perception that they could hear well enough in daily conversations (90%), the presence

of competing life priorities (54%), and concerns of managing hearing aids with poor vision (28%).

Other hearing screening programmes, some of which include a combination of audiometric testing and evaluation of hearing disability, have been reviewed by Chou and colleagues [11] to provide a recommendation for the US preventative services task force. Chou et al. state, "because the effectiveness of any hearing screening strategy will depend on how likely persons who might benefit from hearing aids are to actually use them, research is needed on effective methods for enhancing follow-up rates and uptake of recommended treatments..." Essentially, the limited success of hearing screening programmes may be associated with a poor understanding of hearing help-seeking behaviours in older adults, and a limited choice of rehabilitation options for adults experiencing hearing disability. In a recent Australian study, major barriers to help-seeking for hearing impairment and the successful use of hearing aids were identified and included negative attitudes to hearing aids, lack of family support and low self-efficacy for hearing aid use [12].

The current model of rehabilitation of older adults with hearing loss may limit the uptake of services, and therefore the perceived efficacy for hearing screening memes for older adults. Audiological assessments are primarily based on hearing thresholds and discrete word or sentences tests in quiet and in noise, but lack a holistic understanding of individuals and their families, their cognitive abilities and perceived readiness for treatment and self-efficacy; all important factors in achieving effective outcomes via hearing devices or other rehabilitation pathways. Consequently, professional-client interaction is often based around discussions about technology and goals centred on improving hearing and communication ability which, while important, lack consideration for motivation or perceived ability to engage in a rehabilitation programme. Rehabilitation in hearing healthcare is dominated by an acute illness model of care (i.e. offering a single solution of hearing devices), rather than a chronic disease model of care. This is compounded by the fact that many hearing healthcare private and public funding models focus on intervention outputs, such as the numbers of hearing aids fitted, rather than outcomes (i.e. its effectiveness), which is more difficult to

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quantify. Hearing aids certainly address some of the difficulties and reduce some of the impacts associated with hearing impairment however they only partly address the handicapping effects of hearing loss.

While hearing screening programmes are an important step in the early identification of hearing loss in older adults, much-needed research is currently being conducted in identifying appropriate and acceptable hearing healthcare solutions and service delivery models, and maximising the uptake of these solutions, by optimising technological strategies and reducing barriers to its uptake. With the changing practice of audiology, it is anticipated that hearing screening programmes will show greater success in the near future.

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**Declaration of Competing Interests**  
None declared