



EDITORIAL

Hearing Impairment and Risk of Dementia and Cognitive Decline: Early Intervention and Prevention Strategies

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To the Editor

The mounting evidence linking age-related hearing loss (ARHL) to cognitive decline and dementia represents a critical juncture for public health policy [1]. With emerging data suggesting that timely hearing interventions can reduce dementia incidence by approximately 32% and slow three-year cognitive decline by roughly 62%, we can no longer afford to view hearing loss as a benign consequence of aging [2,3]. It is a modifiable risk factor that, when addressed, significantly improves quality of life and preserves cognitive function. To mitigate this impact, we must transition toward a comprehensive, multi-faceted framework that prioritizes early detection and accessible care. By integrating hearing health into standard geriatric assessments and public health initiatives, we have a profound opportunity to reduce the burden of cognitive impairment in our aging population. In light of these findings, I propose the following important points as a preventive strategy:

Primary Prevention: Primary prevention aims to reduce the risk of hearing loss by controlling modifiable risk factors. These includes:

- o Noise Exposure Reduction: Promote safe-listening practices and enforce noise-reduction regulations in occupational and recreational settings.
- o Ototoxic Medication Awareness: Healthcare professionals should carefully monitor patients taking ototoxic medications and provide education on potential hearing-related side effects.

- o Management of Cardiovascular Risk Factors: Address conditions like hypertension, hyperlipidemia, and diabetes, which are associated with both hearing loss and cognitive decline.

Secondary Prevention: Secondary prevention focuses on early detection and treatment of hearing loss.

- o Regular Hearing Screenings: Implement routine hearing screenings for individuals over 60 years of age during regular health check-ups, with immediate audiometry referrals for those reporting hearing-related challenges.
- o Cognitive Screening: Cognitive function testing should be considered alongside audiometry for elderly individuals with hearing problems.
- o Family History Awareness: Individuals with a family history of hearing loss should seek medical attention from a physician or otolaryngologist upon noticing a decline in hearing ability.
- o Clinical Assessment: Health practitioners should carefully collect clinical histories to identify underlying causes, risk factors, and the functional and emotional impacts of hearing loss, such as depression and social isolation.

Tertiary Prevention: Tertiary prevention aims to minimize the impact of hearing loss on cognitive function and quality of life.

- o Hearing Aids and Assistive Listening Devices: Counseling and patient education regarding hearing

aids and assistive listening devices are essential, tailoring recommendations to individual needs and expectations.

- o Auditory Rehabilitation: Offer auditory rehabilitation programs that include communication strategies, speechreading training, and cognitive training.
- o Social Support: Encourage social engagement, participation in activities, and support groups to combat social isolation and loneliness.

Public health initiatives

- o Workplace Hearing Conservation Programs: Implement comprehensive workplace hearing-conservation programs and legislate to control occupational, environmental and recreational noise exposure.
- o Affordable Hearing Healthcare: Address the financial burden of hearing aids, which often poses a barrier, even in well-resourced settings, also requires new and innovative policies.
- o Integration into Primary Care: Integrate ear and hearing care into primary health care systems and allocate appropriate funding.
- o Professional Development: Develop trained healthcare professionals through suitable career-development opportunities.
- o Targeted Screening: Screening programs should particularly target at-risk populations; specifically, the elderly, people in noisy occupations, and patients on ototoxic medications. Link screening to accessible pathways to hearing devices, including aids, implants, and assistive technologies as part of a universal health coverage strategy.

Recommendations for clinicians caring for older adults with age related hearing loss (ARHL) who are also at risk for cognitive decline

- o Perform a detailed audiometric profile that highlights the characteristic sloping loss above 1 kHz while confirming the relative preservation of low-frequency cues; this information will guide the frequency-specific gain required [4].
- o Prescribe amplification that is louder in the 1 kHz-plus region and more modest in the low-frequency bands, using multi-band fitting software to tailor gain for each spectral slice of speech [4].
- o Select slow-acting compression (SAC) as the default setting for all older-adult users, because it preserves temporal envelope cues that are critical for speech comprehension and for reducing listening effort both of which support cognitive health [4-6].
- o To optimize patient outcomes, clinicians should judiciously select advanced signal processing features

such as compression speed and ratio, noise reduction, frequency lowering, and other potential distortion-inducing algorithms, ensuring they are only activated after a thorough evaluation of their specific impact on the integrity of the speech envelope. Prior to finalizing these settings, it is essential to verify that such manipulations do not compromise temporal cues or phonemic clarity. Furthermore, in challenging acoustic settings, clinicians are encouraged to proactively enable noise reduction parameters to effectively suppress non-speech sounds, a strategy that serves to enhance listening comfort and minimize cognitive fatigue for the user [4].

- o Adopt a holistic audiology model that blends objective and subjective outcomes measure real ear aided response and speech in noise scores while also collecting patient reported satisfaction, preference, and perceived effort [4,5].
- o Provide comprehensive counseling educate the client and caregivers about the link between audibility, reduced listening effort, and cognitive health; discuss realistic expectations, device maintenance, and the importance of consistent wear [5].
- o Ensure compliance through personalized fitting and follow up schedule regular check ins to verify that the prescribed settings remain optimal as hearing thresholds evolve, and adjust features (e.g., noise reduction levels) to maintain both hearing and cognitive benefits.

By systematically addressing clinical protocols, the audiologist can deliver an “optimal hearing aid fitting” that maximizes speech intelligibility, minimizes cognitive strain, and supports the overall quality of life for elderly patients with age-related hearing loss (ARHL) [6]. However, further research is essential to fully elucidate the complex mechanisms underlying the association between hearing impairment and cognitive decline. Future longitudinal studies are needed to rigorously determine the impact of hearing loss interventions on long-term cognitive outcomes and to identify specific patient subgroups that stand to benefit most from targeted rehabilitation. Simultaneously, research efforts should prioritize the development of more sophisticated hearing aids and assistive listening devices, while exploring novel, evidence-based strategies for auditory rehabilitation to combat the progression of dementia in the aging population.

References

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