

Personal Sound Amplifiers for Adults with Hearing Loss

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ABSTRACT

Age-related hearing loss is highly prevalent and often untreated. Use of hearing aids has been associated with improvements in communication and quality of life, but such treatment is unaffordable or inaccessible for many adults. The purpose of this review is to provide a practical guide for physicians who work with older adults who are experiencing hearing and communication difficulties. Specifically, we review direct-to-consumer amplification products that can be used to address hearing loss in adults. Helping adults with hearing loss navigate hearing loss treatment options ranging from being professionally fitted with hearing aids to using direct-to-consumer amplification options is important for primary care clinicians to understand given our increasing understanding of the impact of hearing loss on cognitive, social, and physical functioning.

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Hearing loss in older adults is highly prevalent and doubles per age decade, with onset beginning as early as one's 40s or 50s. Age-related hearing loss begins gradually and can progress for years before an individual begins to experience subjective hearing difficulties. Further, hearing complaints tend to initially manifest in difficult listening situations, such as group discussions at work or conversations in a noisy

setting, like a restaurant. The gradual progression and common occurrence of age-related hearing loss leads many individuals with communication difficulties, as well as medical providers, to treat hearing loss as a normal and inconsequential part of aging. However, a growing body of evidence suggests that age-related hearing loss may directly contribute to an increased risk of cognitive¹⁻³ and physical declines.^{4,5}

Over two-thirds of adults aged > 70 years (~30 million Americans) have a clinically significant hearing loss.⁶ With increasing evidence of independent associations between hearing loss and negative outcomes among older adults, such as accelerated cognitive decline,³ decreased physical functioning,⁷ increased hospitalization,^{8,9} and mortality,¹⁰ the provision of hearing health care has been raised as a possible low-risk intervention that may delay these outcomes and promote healthy aging.^{11,12} Hearing aids, along with education and counseling, form the foundation of intervention for age-related hearing loss. However, < 20% of persons with hearing loss use hearing aids.¹³ From a public health perspective, the low rate of treatment for age-related hearing loss underscores the need for new approaches to the provision

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of hearing technologies and services in order to reduce the gap between those with hearing loss and those who are able and willing to access care.

Numerous barriers limit access to hearing health care, particularly the high cost of hearing aids (average cost is \$3000-6000 for a pair¹⁴), and lack of coverage by Medicare and other insurance companies.¹⁵

Another impediment to accessing care is that the patient must visit the audiologist 4 to 6 times over a 4-month period to be properly assessed and fitted with customized technology. Despite the associated cost and required commitment, hearing aid use has been shown in multiple studies to improve communication and quality of life.¹⁶⁻¹⁸

Due to the positive outcomes associated with treating hearing loss and the prevalence of age-related hearing loss among older adults, the National Institutes of Health/National Institute on Deafness and Other Communication Disorders and the Institute of Medicine have called for increasing the affordability and accessibility of hearing health care.^{12,19}

One step toward improving the affordability and accessibility of hearing health care is to consider the utility of low-cost amplification devices that can be directly purchased by consumers rather than having to be dispensed and fitted by an audiologist or hearing instrument specialist. The purpose of this review is to provide an introduction to the use of direct-to-consumer hearing devices as communication options for adults with hearing loss who are not ready to undergo formal audiological services, or who are unable to afford hearing aids. The 3 sections of this review will provide practical guidance and tools that can be discussed with patients who have hearing complaints in order to enhance communication and social engagement. The first section summarizes what to expect from best-practice professional audiology services and professionally fitted hearing aids. The second section describes the types of hearing devices that are available to consumers and important technological and user features that make devices most appropriate for some persons with age-related hearing loss. Finally, the third section focuses on considerations for older adults that may guide recommendations for accessing professional hearing health care or improving communication using over-the-counter technologies.

PROFESSIONAL AUDIOLOGY SERVICES

Professional audiology services provide a customized approach to addressing a person's hearing loss with hearing aids (and other technology as necessary) prescribed in response to an individual's listening needs and lifestyle. The

role of the audiologist is to first perform comprehensive diagnostic services and make appropriate medical referrals when needed. Then, an audiologist should perform an in-depth needs and lifestyle assessment to customize the amplification device to a person's hearing loss and listening needs. In terms of technology, the most frequently used

devices are programmable hearing aids that are precisely tuned to the individual's hearing loss. Hearing loss is typically not the same across all the sounds important for human hearing. For age-related hearing loss, it is most common for patients to hear low-frequency sounds (eg, "ah" as in "father") better than they can hear high-frequency sounds (eg, "s" as in "toss"). Importantly, a professionally fitted hearing aid can be programmed such that the volume at different frequencies is specifically adjusted to match the hearing loss of each individual.

A key component of successful audiology services is to educate the person with hearing loss and

loved ones to ensure appropriate expectation management that entails use of amplification in conjunction with communication strategies to improve listening across a range of situations. Audiologists have completed doctoral-level training on the diagnosis and treatment of hearing loss, which includes skills related to counseling patients on how to cope with their hearing loss and manage daily communication challenges. Traditionally, the price of the services provided by the audiologist, both before and after fitting hearing aids, are bundled into the price of the hearing aids and can comprise 40%-70% of the total cost charged to patients (ie, for a \$5000 pair of hearing aids, approximately 2/3 of the cost actually covers an audiologist's time and services). While professional aural rehabilitation provided by the audiologist offers a "gold standard" approach to treating hearing loss, the traditional model remains unaffordable and inaccessible to many individuals. Importantly, some individuals may not require the comprehensive set of services that an audiologist would provide and that is "bundled" into the cost of professionally dispensed hearing aids regardless of patient need.

DIRECT-TO-CONSUMER AMPLIFICATION

While traditional hearing aids remain unaffordable for many people, the increasing market for consumer electronics and wearable technology (in this case, personal sound amplifiers), presents new opportunities for "do-it-yourself" amplification. The landscape of consumer electronics as it relates to hearing devices is difficult to navigate. From a technology standpoint, both hearing aids and personal sound amplifiers are designed

CLINICAL SIGNIFICANCE

- Two-thirds of adults > 70 years have a clinically significant hearing loss, and hearing loss may directly increase risk for cognitive decline and dementia.
- The high cost (~\$4000 for a pair of hearing aids) and inconvenience (multiple visits needed for fitting and adjustments) of hearing health care limits access for many older adults.
- Certain direct-to-consumer amplifier products can be a helpful, affordable, and accessible initial option for addressing hearing.

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