

Hearing aid outcomes in older adults: what and when to measure

BY LARRY E HUMES

What matters to older adults when purchasing a hearing aid? **Larry Humes** explores the domains that should be measured for this key group.

This article identifies key domains of hearing aid outcome in older adults. Increasingly, third-party payers and private-pay patients are requesting evidence that hearing aids are beneficial. This article is an overview of research we have conducted over the past 15-20 years that identifies what should be measured in older hearing aid wearers and when it should be measured.

Background

Depending on how one defines 'hearing impairment', approximately 30-40% of those over age 65 have impaired hearing such that it interferes with everyday communication [1]. Despite this, research in the US and elsewhere indicates that only 15-25% of older adults with impaired hearing seek out and receive hearing aids, the primary form of treatment for age-related hearing loss [2]. Nonetheless, adults over the age of 65 purchase approximately two thirds of the hearing aids sold in a given year [3]. With older adults representing the primary purchasers of hearing aids, together with the fact that many more older adults could receive benefit from hearing aids, it is important to understand what should be measured to provide evidence of the benefits received. In addition, it is important that the benefits received from amplification be measured at a time when such benefits are likely to be stable.

What to measure

We have conducted a number of studies to evaluate what should be measured by an audiologist or other service provider to document the benefits received [4, 5]. Our basic approach to addressing this issue has been to obtain a large number of outcomes from a large number of older adults with hearing aids fitted using audiology best practices then use sophisticated statistical techniques, such as principal-components factor analysis, to determine the redundancy among these outcome measures.

When conducting research of this type,

it is important to obtain measures from a range of domains and to have multiple measures from each domain. Based on prior research examining hearing aid outcomes, we knew that it was likely to be important to tap both self-reported measures of hearing-aid benefit, satisfaction and usage, and, where possible, objective measures of each domain. The most commonly used measure of 'objective benefit' involves measuring the percentage of words heard correctly by the patient, both with (aided) and without (unaided) the hearing aid. These are considered to be 'objective' measures of benefit because the words reported by the patient can be compared to the words presented to the patient over the loudspeaker to determine the percentage of words heard correctly. For example, one might have correctly repeated 30 of 50 words correctly, 60% correct, in an unaided listening condition, then improve to 40 of 50 words correct, or 80%, for the aided listening condition. This would be considered to be an improvement, or relative objective benefit, of 20 percentage points in this example.

Self-reported measures, on the other hand, including self-reported benefit, cannot be scored as correct or incorrect by the examiner. That is, if the patient indicates that the hearing aids are not very helpful in noise, the examiner cannot score that as incorrect, as much as he or she may want to do so! There are a variety of ways in which such self-reported measures can be obtained, especially for self-reported benefit. It is possible, for example, to simply request assessments of how 'helpful' the hearing aid has been over the past several weeks of use and across a variety of everyday listening conditions. For example, "You are seated at a table in a crowded restaurant having dinner with your spouse, seated across from you. In this situation, your hearing aids are: very helpful, helpful, somewhat helpful, neither helps nor hurts performance, hinders performance." A series of listening situations can be presented to the hearing aid wearer and, after each, a rating of the hearing aids'

helpfulness is requested. In this case, a single self-report survey may be completed after the hearing aid has been used for a period of time. The use of 'helpfulness' as the judgment criterion basically requests the wearer to think back in time to how he or she performed in that same situation without the hearing aids. Another self-report approach is to have the patient complete a baseline survey regarding their performance in unaided listening conditions prior to being fitted with hearing aids. Subsequently, after wearing hearing aids for a period of time, the same survey is completed and the differences in performance between the aided and unaided surveys provide a measure of relative benefit reported by the wearer.

When the series of outcome measures in older adults with a wide range of outcome measures included had been completed, results were subjected to factor analyses to determine the redundancy among the measures. When doing so, the initial studies may have included 10-20 separate measures of outcome. In the end, however, these were found consistently to result in only 3-4 dimensions of hearing aid outcome. In particular, measures of hearing aid usage (e.g. self-reported hours of use per day), objective speech-recognition benefit, self-reported benefit and self-reported satisfaction typically emerged as the main components of hearing-aid outcome in older adults. Moreover, most often, the self-reported measures of benefit and satisfaction were often correlated collapsing into a single factor referred to as 'benefaction' [4, 5]. That is, it was not necessary to measure both self-reported benefit and self-reported satisfaction because they were strongly correlated; either would suffice. There are many reliable and valid measures of hearing-aid usage, benefit / satisfaction, and speech-recognition benefit from which the audiologist can choose. It is important, however, that measures should be obtained from each of these three outcome domains.

When to measure

Our research also focused on when to obtain such measures [4, 5]. Over the course of various studies, we'd examined intervals as short as one week post-fit to as long as three years post fit. In the end, the results supported a measurement point at 4-6 weeks post-fit for each of the outcome domains. Research indicated that there may be some statistically significant changes in outcomes after that measurement point, but the magnitude of the changes was not clinically or practically significant. Further, there were strong correlations across measurement intervals indicating that those who were top performers or poor performers at 4-6 weeks post-fit were also likely to be top performers or poor performance at later post-fit measurement points. Thus, if one fits the hearing aids and then evaluates the outcomes after a 4-6 week trial period, this is a stable point of measurement that will be predictive of performance later in time.

Summary

- It is important to document hearing-aid outcomes in older adults, the most frequent purchasers of hearing aids
- Hearing-aid outcome is a multi-dimensional construct requiring measurement of performance in each

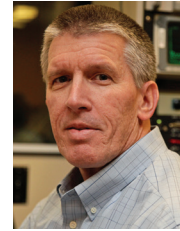
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- The three key dimensions of hearing-aid outcome identified to date are: 1) hearing aid usage (e.g. hours per day, either self-reported on survey or read directly from digital hearing aid); 2) self-reported hearing aid benefaction (either self-reported benefit or satisfaction); and 3) objective speech-recognition benefit (percentage of words heard with the aids minus percentage of words heard without the aids)
- Reliable and valid outcomes in each domain can be obtained 4-6 weeks post-fit.

References

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