



Dennis Van Vliet

When it comes to audibility, don't assume. Measure!

By Dennis Van Vliet

We follow some basic minimum standards in the things that we do regularly to ensure they lead to an appropriate outcome. For example, if we commute to work, we may have several options for how to get there. However, all the realistic choices meet certain requirements. They are within the law; they provide an acceptable level of safety and comfort; they are cost effective; and they meet reasonable standards for punctuality and reliability.

These are common-sense assumptions, but considerable time and expense may be needed to make sure that the intended purpose of the endeavor is fulfilled. The gold standard for fulfillment typically includes some type of objective measurement.

AUDIBILITY COMES FIRST

In the endeavor of providing better hearing by means of hearing aids, there are a number of standards that we try to meet. Among those are: comfort, satisfaction, convenience, cosmetics, cost effectiveness (value), and benefit. However, the paramount goal of amplification on the way to meeting any standards we can think of is *audibility*.

Without audibility, the rest of the standards we strive for are useless because the basic function of the hearing aid has not been achieved. This may seem like stating the obvious, but it is apparently not so simple. Not long ago, several of us were involved in an extended e-mail conversation about the merits of a recent peer-reviewed journal article. The article said that the hearing aids were fitted in accordance with "...standard of care procedures." We all know the researcher, and have no doubt the standards of care were very good. However, the article failed to specify what those standards were, making replication of the results difficult without talking to the author.

In his most recent *Hearing Journal* cover story (October 2005), Gus Mueller noted that only 30% of those who dispense hearing aids report that they routinely use probe-microphone measures when fitting hearing aids. I have observed discouragingly similar numbers in continuing education meetings throughout the country with participants from a variety of clinical settings.

How is it that a peer-reviewed journal does not insist upon detailed descriptions of the fitting method employed in a study, thereby assuring the critical reader that sufficient audibility was present? And, why is it that the general population of hands-on clinicians does not routinely use an essential tool to measure the audibility of hearing aid fittings? I would speculate that the fundamental goal of audibility is so obvious that it is simply *assumed* by clinicians, who then move ahead with the more exciting elements of a fitting or research study without verifying audibility.

Assumption is a dangerous co-pilot in any endeavor, certainly including the fitting of hearing aids.

NO SUBSTITUTE FOR MEASUREMENT

Patients are typically very willing to give us their feedback on the amplification provided by a new or modified hearing aid fitting. In a typically busy clinical day, it is tempting to accept an enthusiastic response from the patient, assume that our audibility goals have been met, and move on to the next patient.

However, as anyone who routinely uses probe-microphone measures can attest, the response that is delivered to the ear may have no correlation with the patient's perception. A big peak at 2000 Hz may give the patient an initial perception of benefit. But unless the clinician measures the response, he or she does not know if the higher-frequency audibility goals have been met.

We may be further lulled into the assumption mode by the impressive graphics provided by the hearing aid manufacturer's fitting software, which provides a "representation" of the 2-cc or real-ear response of the fitting. In practice, we know that frequently this display comes nowhere close to representing what is really present in the ear. That means that using these graphics as a guide to fitting is not much better than guesswork, and to neglect to use probe-microphone measures to verify the actual fitting is irresponsible.

The differences between what we really get in the ear and what is represented on the manufacturer's software screen result in part from anatomical and equipment differences that create calibration errors. In addition, because manufacturers differ so in their approach and representations, they must be using very different assumptions and calibration factors to create their on-screen displays.

The bottom line is that a manufacturer's on-screen programming screen cannot be trusted to represent what the hearing aid system is delivering to the ear. We must measure to know for sure.

The Final Word? If there is a holy grail in the hearing aid fitting process, it is audibility. Audibility may not correlate as closely as we'd like with patient satisfaction or other subjective outcomes, but common sense tells us that if there isn't audibility, we are not providing benefit. Audibility goals need to be verified by direct measurement. Relying on subjective comments, clinical experience, or derived representations is not an acceptable standard of care. Further, if we are to make good use of research, peer-reviewed articles involving hearing aid fittings need to clearly specify the hearing aid fitting data so that audibility can be determined.

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