Sound Check

CLINICAL BULLETIN #4

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Assessing Digital Literacy and Determining Wireless Streaming Candidacy

As most audiologists know, there are myriad wireless technologies available in all prescription hearing aids, including several different Bluetooth streaming protocols. Regardless of the specific streaming protocol in a smartphone-integrated hearing aid, many individuals underuse or flat-out do not use Bluetooth streaming to listen to podcasts, enjoy music or talk on the phone.

Some individuals may value wireless streaming and benefit from it on Day 1 of hearing aid use. Others may choose to ignore the wireless streaming features and never use them. A few even might be wireless streaming-curious, needing coaxing and coaching to begin using their smartphone-integrated hearing aids – sometimes a year or more after acquiring it.

The purpose of Clinical Bulletin #4 is to outline a practical strategy for determining how Bluetooth wireless streaming features can be prioritized for new hearing aid wearers. Further, this bulletin provides common-sense insights on when and how to introduce Bluetooth streaming into the individual's communication goals as targeted on the Client-oriented Scale of Improvement (COSI).

Smartphone-integrated Hearing Aids Are Needed

To fully adopt and use smartphone-integrated hearing aids, of course, wearers must first possess a smartphone. According to the most recent Pew Research surveys, the percentage of older adults owning smartphones has risen substantially in recent years, with a 2021 survey showing that 61% of those 65 and older own a smartphone. This is up from 53% in 2019 (Pendlebury, 2021) and reflects a continuing trend: increased smartphone-enabled technology adoption by older adults.

Wireless streaming, a feature requiring smartphone-integrated hearing aids, and its popularity also appears to be rising. A recent analysis of more than 891,000 adult hearing aid wearers from around the world indicated that over 50% of wearers of a recently launched premium hearing aid used their hearing aids to stream music, podcasts or phone calls at least once a day (Pruess & Bulut, 2025). The researchers also reported that respondents' current streaming time with the newest model represented a 5 to 8% increase in streaming time compared to wearers of earlier platforms of the same brand. Finally, the researchers reported the average amount of time per day streaming was 36.5 minutes, a three-to-four-minute increase over earlier platforms. These data suggest that a growing number of hearing aid wearers, albeit slowly, are spending more time streaming directly to their hearing aids to do three things in roughly equal numbers: listening to music, listening to podcasts or conversing on the phone.

Overcoming the Digital Divide:

Identifying Wireless Streaming Candidates

According to the Audiology Practice Standards Association (APSO) guideline S2.1 Hearing Aid Fitting for Adult & Geriatric Patients (2021), "assistive technology and accessories are considered to facilitate accessibility to other devices and to satisfy the wearer's listening and communication needs." Given these best-practice guidelines, a key part of hearing aid fitting procedures should include a careful assessment of wireless streaming candidacy.

If the availability of Bluetooth wireless streaming on hearing aids leads to better outcomes and APSO guidelines call for recommending it, then clinicians should triage candidates into the following three categories during the hearing aid evaluation:

1. Competent and Confident Streamers: Wearers likely to benefit from wireless streaming immediately and need little to no additional instruction and guidance on how to integrate their smartphone into the wireless streaming process.
2. Coachable Streamers: Wearers likely to benefit from wireless streaming but require additional instruction and guidance on how to successfully integrate their smartphone into the wireless streaming process.
3. Non-streamers: Wearers unlikely to want or need wireless streaming. However, their desire or need to use wireless streaming may change in the future. Therefore, wireless streaming abilities should be re-assessed at periodic follow-up visits.

Wireless Streaming Candidacy Considerations:

Three Categories, Five Questions

Self-assessment inventories have been a valuable part of the hearing aid selection and fitting process for many years. As detailed by Taylor & Mueller (2025), self-assessment inventories can be used to a.) determine if there is impairment, b.) as a needs assessment for treatment planning, and c.) as a validation measure of benefit, satisfaction and quality of life improvements. During an initial consultation self-assessment inventories can be a particularly useful way to quickly identify listening situations where the individual is experiencing communication difficulties and to prioritize hearing aid features important to the individual.

Some self-assessment inventories help clinicians select the most suitable hearing aid features based on the individual's priorities and needs. The Hearing Aid Selection Profile (HASP), developed by Jacobson et al (2001), and its cousin, the 9-question Characteristics of Amplification Tool (COAT), developed by Sandridge and Newman (2006) are two such self-assessments that have been used to prioritize hearing aid features for the individual. The COAT is clinically useful, developed 20 years ago, does not have any questions that rate the importance of wireless streaming. Consequently, its usefulness with smartphone-integrated hearing aids is limited.

Recently, audiologists at Western University developed the Hearing Aid Attribute Feature and Importance Evaluation (HAFIE) questionnaire (Saleh, et al 2023). The HAFIE is divided into nine sections: Smartphone-based Technology, Multi-environment Functionality, Comfort and Appearance, Convenience and Connectivity, Ease of Use, Audibility and Speech Intelligibility, Streaming, Batteries & Charging, and Hearing Aid Styles. The creators of the HAFIE have also

developed a 14-item shortened version. Although 14-items is still too long for clinical use, there are three HAFIE questions, when modified, that can be used in the wireless streaming candidacy triaging process.

The first step in the wireless streaming triaging process is determining the importance of using wireless features for the individual. This step is completed by administering the three streaming questions, adapted from the HAFIE. Figure 1 illustrates the three streaming questions that are asked during the communication assessment to judge the priorities and needs of the prospective wearer. If the individual ranks any of the three questions as "very important" or "important," this would be an indication the individual falls into either Category 1 (Competent and Confident Streamer) or Category 2 (Coachable Streamer), and communication goals that involve wireless streaming can be immediately targeted.

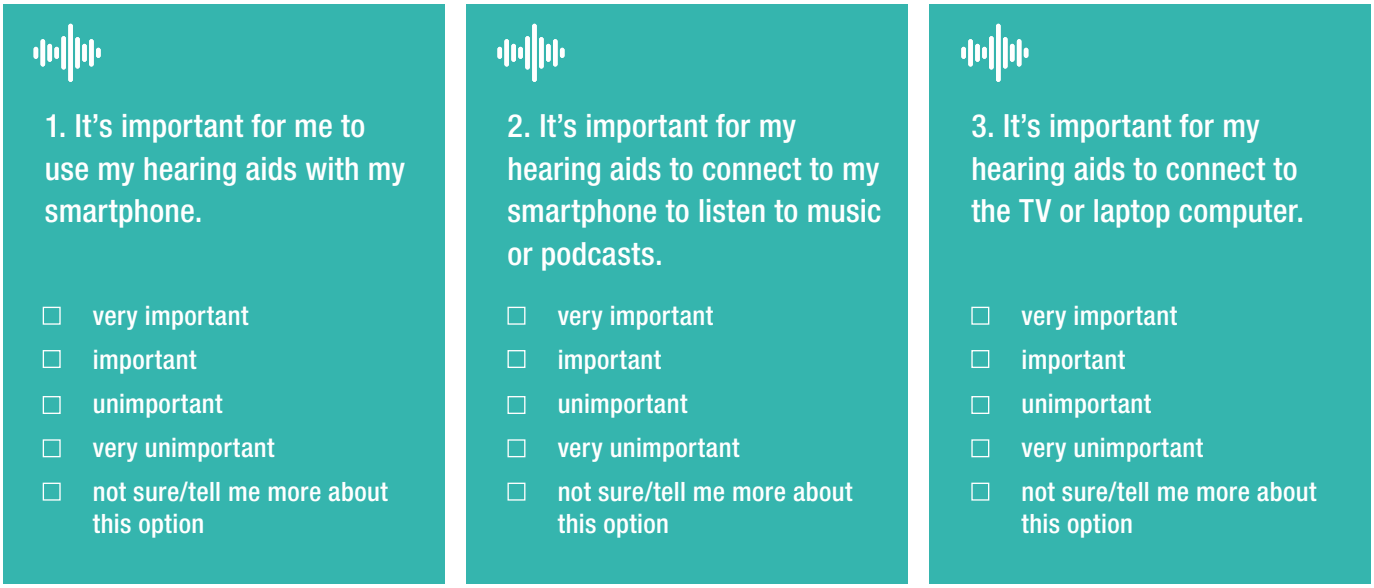

Figure 1. Three wireless streaming questions, modified from the HAFIE (Saleh, et al 2024).

The second step in the wireless streaming triaging process is assessing the digital literacy of the individual. After all, if an individual lacks the skills and confidence to navigate smartphone-integrated features, even when deemed important, that person is unlikely to receive benefit from them. Digital literacy refers to the ability to effectively and responsibly use a smartphone, computer and other forms of modern electronic communication in everyday life. Included in this definition is the ability to navigate the basic interface of a smartphone, use the smartphone or computer to communicate with others via texting, talking, e-mailing, and the ability to search for, assess, and verify the credibility of online information accessed through a smartphone or computer (Roque & Boot, 2018). In short, to effectively use smartphone-integrated wireless streaming in hearing aids, individuals must demonstrate digital literacy.

Given the prevalence of smartphone-integrated hearing aids and their potential benefits, assessing digital literacy of prospective wearers is essential. The two-question Digital Literacy (DL-2Q) questionnaire was developed by Ferguson et al (2024) to better understand the tech savviness of hearing aid candidates. The DL-2Q, illustrated in Figure 2, is comprised of two questions, one that evaluates smartphone skills (competency) and the other that evaluates self-belief (confidence) in using smartphones. Note that in the original version of the DL-2Q, the term, mobile phone is used. The version shown here substitutes the term, smartphone, a term more commonly used in the U.S.

Ferguson et al (2024) validated the DL-2Q by comparing results of 110 adults ranging in age from 52 to 96 years to the 16-question Mobile Device Proficiency Questionnaire (MDPQ-16) (Roque & Boot, 2018). They showed a positive association between the MDPQ-16 and DL-2Q, indicating the DL-2Q is a valid measure of smartphone digital literacy.

1. How would you rate your skill level using a smartphone?

- ☐ never used
- ☐ beginner/novice
- ☐ competent: "I use my smartphone and apps daily."

2. How confident are you using a smartphone?

- ☐ not confident and usually need help
- ☐ it depends on the task
- ☐ I am confident

Figure 2. The DL-2Q developed and validated by Ferguson, et al (2024).

In their validation of the DL-2Q, which compared participant scores on it to the MDPQ-16, Ferguson et al (2024) uncovered two clinically useful findings, illustrated in Figure 3. First, it shows that younger adults (52 to 64 years old) and older adults (86 to 92 years old) are aligned with how we might expect age to influence digital literacy: The oldest adults have poor digital literacy relative to the youngest adults who participated in the study. Second, as illustrated by the red box in Figure 3, 76% of the adults aged 65 to 85 years old had digital proficiency scores better than the average MDPQ-16 score, indicating that 24% of adults in this age range score below average on digital literacy competence (represented by the blue box).

Further, Ferguson et al (2024) states there was a mismatch between competence and confidence for the group aged 65 to 85 years old. They reported that 44% of individuals in this age group were digitally competent but lacked confidence when completing smartphone-related tasks. Considering most first-time hearing aid wearers are in the 65- to 85-year-old age range, these findings are clinically meaningful and suggest there are ample opportunities for audiologists to improve smartphone literacy skills through education, training and empowerment.

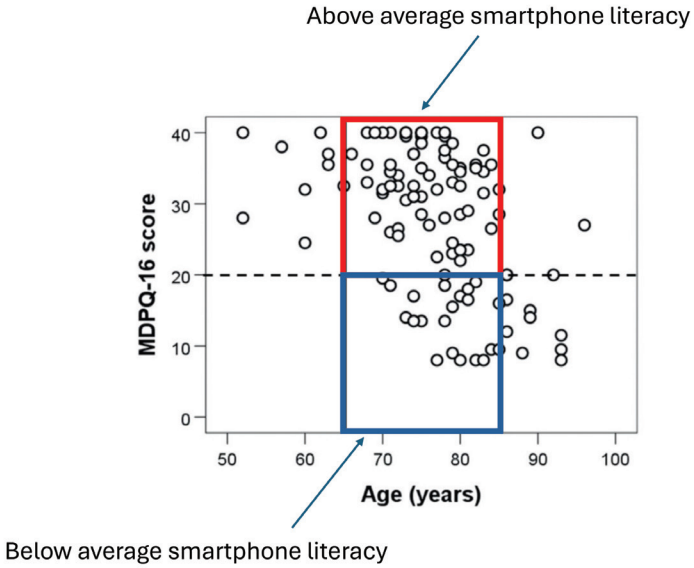

Figure 3. Each circle represents a participant's score on the MDPQ-16 as a function of age. The dotted line is the midpoint for the MDPQ-16. The vertical lines show the midpoint scores for the 65- to 85-year-olds. Modified from Ferguson et al (2024).

Putting It All Together:

Using the 5-Questions in Goal Setting and Treatment Planning

The three streaming questions from the modified HAFIE, combined with the DL-2Q is a useful approach to triaging wearers into three categories a.) Competent and Confident Wireless Streamers b.) Coachable Streamers, or c.) Non-Streamers. Table 1 illustrates the results for the 3-questions HAFIE and DL-2Q along with how to apply those findings in the goal setting and treatment planning process.

Wearer Category	Competent and Confident Streamers	Coachable Wireless Streamers	Wireless Non-Streamers
Results of 3-streaming questions	"important" or "very important" rating for 1 or more questions	"important" or "very important" rating for 1 or more questions	"unimportant" or "very unimportant" ratings for all 3 questions
Results of DL-2Q	"confident" and "competent" rating	"never used"/"beginner" *and/or* "not confident"/ "depends on the task" rating	"never used"/"beginner" *and/or* "not confident"/ "depends on the task" rating
How to Apply Findings (Next Steps)	Move immediately to setting goals that involve wireless connectivity	Provide additional personalized instruction and guidance on smartphone integration as part of the initial wearer experience	Re-evaluate in 6 to 12 months by re-asking the five questions

Table 1. Three categories of smartphone-integrated hearing aid wearers, results from 3-streaming questions + the DL-2Q and a summary of how to apply those findings in the goal setting process.

Smartphone-Competency vs. Smartphone-Confidence

What Needs to be Coached?

The DL-2Q assesses digital literacy along two fronts: competency and confidence. Competence refers to an individual's skills, knowledge, and abilities an individual possesses to perform a specific task effectively. Confidence, on the other hand, is the belief in one's ability to succeed and take action, even if that individual is competent in the specific skill or expertise. There are many ways to describe the difference between competence and confidence. One example is an athlete competing in the Olympics. Obviously, the athlete who has qualified for the Olympics is highly competent, but if he is so nervous before this monumental event that his performance suffers, it is possible his low self-confidence might be a contributing factor. In contrast, the sprinter who dominates in the 100-meter dash at his local high school might be abundantly confident he can compete with Division I sprinters. But when the opportunity to compete with them arises, he falls woefully short of his expectations and embarrasses himself. The latter is an example of overconfidence.

You don't need to be an athlete to appreciate that the same holds true with smartphone-integrated hearing aids. A wearer might display a high level of smartphone competence but when faced with a new task, like integrating it with hearing aids to stream a favorite podcast, low self-confidence inhibits successful use. Conversely, a wearer might be so overconfident in using the streaming capabilities of his new smartphone-integrated hearing aids that he is embarrassed by his own ineptness gives up too soon and never attempts streaming with his hearing aids again. The challenge for audiologists is recognizing when the wearer needs a boost in self-belief in ability (confidence) or improved skills (competence) and then providing the proper assistance.

Applying the work of Gomez et al (2021), Table 2 outlines interventions strategies, employed by the audiologist, that can be used to boost the confidence or competence of wearers who wish to integrate the audio streaming capability of their smartphone with their hearing aids.

Boost self-belief through empowerment (confidence)	Improve skills (competence)
Use testimonials from other wearers who are successfully streaming with hearing aids	Instruct on how to perform key behaviors/actions associated with streaming
Reframe use of smartphone-integrated hearing aid as a tool that promotes better engagement	Demonstrate key functions and model behaviors/actions
Encourage self-monitoring of streaming successes. Discuss successes with audiologist	Practice these behaviors/actions with the audiologist

Table 2. A summary of tactics that can be used in the clinic to promote improved digital literacy and empowerment with smartphone-integrated hearing aids and streaming.

Empowered wearers with the skills to independently navigate smartphone-integrated hearing aids are much more likely to be successful adopters of streaming technology. However, it is the role of the audiologist to recognize who might need additional coaching and to determine when streaming technology should be introduced into the treatment plan.

For individuals deemed to be confident and competent streamers, clinicians are encouraged to move directly into the goal setting process. Using the Client-Oriented Scale of Improvement (COSI), goals that involve use of wireless streaming can be individualized and recorded, as shown in Figure 4.

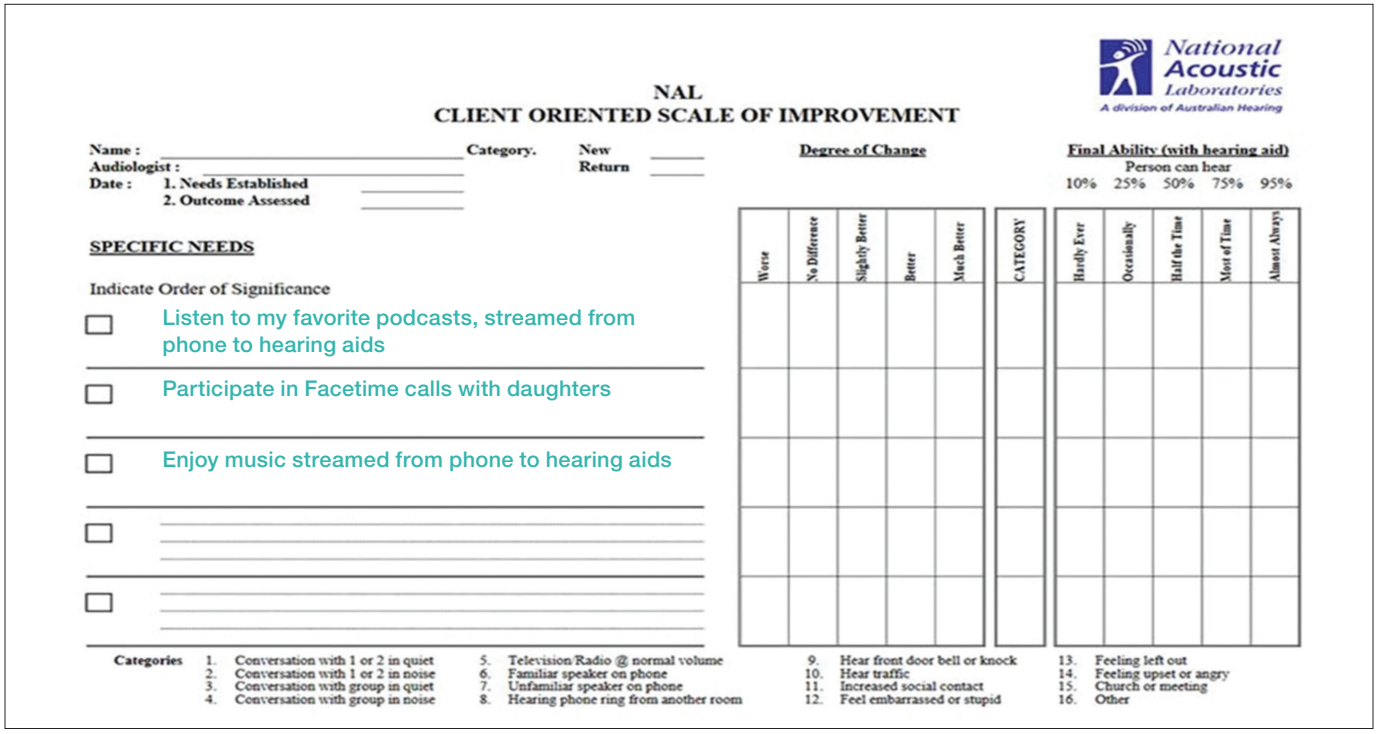

Figure 4. An example of the COSI with goals for an individual deemed to be confident and competent streamers. Note these goals are created after the individual has been deemed to be a competent and confident streamer.

For individuals who express that wireless streaming is important, but lack competence or confidence (Coachable Streamers), clinicians are encouraged to provide more detailed instruction on smartphone-integrated hearing aids. This instruction should be geared to skill development and empowerment that enable the wearer to become a self-confident and independent wireless streamer. Intervention strategies, summarized in Table 2, could take the form of an unbundled, fee-for-service arrangement for Coachable Streamers.

Finally, for individuals who are determined to be non-streamers at their initial evaluation, their status should be re-assessed using the same five questions at periodic follow-up appointments. Skills training and confidence building can be introduced several months, even years, after their initial hearing aid acquisition and provided as a fee-for-service. Given the substantially higher satisfaction ratings of individuals with wireless streaming on their hearing aids, as illustrated in Figure 5, all wearers, regardless of age or digital literacy, should be given the opportunity to take advantage of smartphone-integrated hearing aids and wireless streaming - now or in a few years.

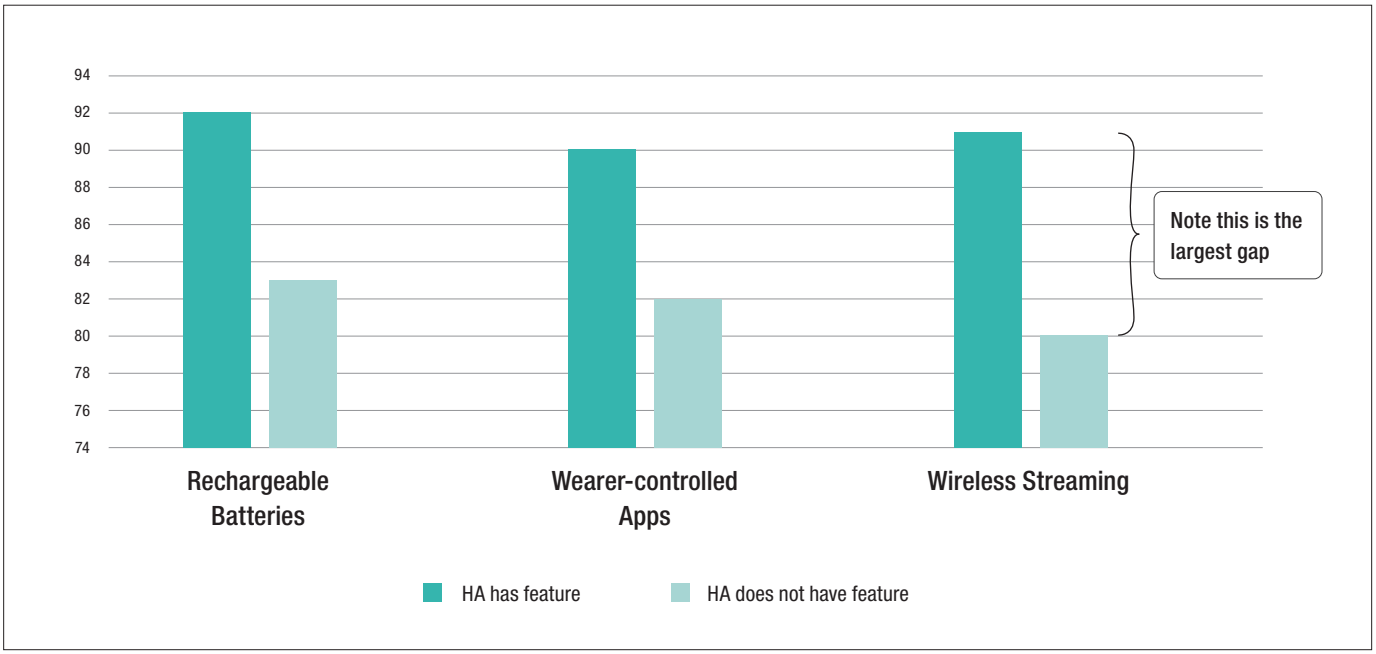

Figure 5. Overall satisfaction scores for two groups of wearers for three new generation hearing aid features. Adapted from Picou (2022).

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