Phonak Target Track.

Clinical trends for mild to moderate hearing losses.

Phonak Infinio introduced a new era in hearing technology with significant advancements in sound quality, connectivity, and speech understanding in noise. This large-scale retrospective data analysis highlights how these improvements may be linked to fitting and hearing aid usage and enhance the clients' experience.

Preuss, M., Bulut, K., March 2025

Key highlights

- Overall, with Infinio, clients wear their devices longer per day compared to previous platforms.
- Clients fitted with APD 3.0 show high wearing time with minimal fine-tuning. This suggests APD 3.0 is playing a significant role in enhancing sound quality and overall client satisfaction.
- With Infinio, 75% of clients attended one fewer clinic visit within the first three months post-fitting compared to previous platforms.
- With Infinio, streaming daily increased by 8% on average, suggesting that the enhanced connectivity provided by the new ERA chip drives increased streaming activity.

Considerations for practice

- Innovations with Infinio foster improved outcomes for clients and indicate higher client satisfaction.
- Infinio may improve efficiency in clinic and result in fewer follow-up appointments, suggesting its contribution towards optimizing the fitting process and saving time spent on adjusting fitting parameters.
- Clients' wearing behavior of their Phonak Infinio hearing aids illustrates their perceived benefit with their hearing aids.
- DataLogging can be a powerful tool to evaluate the client's perceived benefit of hearing aids. It gives insights into daily wearing time, program usage, onboard user controls, and listening environment classification.

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Introduction

Audiology insights from large-scale data analytics

The analysis of large data sets has become a fundamental part of medical device development throughout the healthcare sector. By delving into data, user feedback, treatment effectiveness and long-term outcomes, predictive analytics uncovers hidden patterns and user preferences, allowing to develop medical devices that cater precisely to individual needs. Insights derived from these analyses have proven instrumental in numerous applications, enabling forecasting pathways towards the improvement of patient outcomes (Cote, 2021; Flanigan, 2017; Healthcare Data Analytics, 2023) and monitoring equipment performance. Data analytics of this nature have also been used to evaluate the efficacy of medical treatments, clinical protocols, and provide patients with insights that empower them to take a more active role in managing their health (Cote, 2021; Flanigan, 2017; Healthcare Data Analytics, 2023).

Data analytics have also proven valuable in audiology, providing insights on adherence to clinical guidelines, types of hearing loss managed with hearing aids, hearing aid use patterns, and the programming of hearing aid features. At Phonak, we use these analyses to provide valuable insights into hearing aid fitting workflows and usage across various client demographics and levels of hearing loss. The objective of the project summarized here was to gain a deeper understanding of fitting and usage behaviors among Infinio users, aged 19 and above, with a mild to moderate hearing loss. This was achieved by analyzing a substantial number of adult hearing aid fitting files.

Data collection

Data are collected for every fitting completed with the Target software in alignment with global legal and privacy requirements, see the *EU Medical Devices Regulation (Regulation (EU) 2017/745 of European Parliament and the Council of 5 April 2017 on medical devices)* and 45 C.F.R. § 164.501 et seq. Collection of these data is motivated by Sonova's legitimate interest in generating insights that advance best practice recommendations for hearing care professionals (HCPs) with an aim to improve client outcomes. Aggregated and pseudonymized data is processed with appropriate safeguards, ensuring privacy protection and compliance with data protection regulations, balancing our legitimate interests with the rights of individuals. During this study, we collected data pertaining to hearing care professionals' utilization of the Target software in US, Canada, Germany, France, UK, Australia and New Zealand and particularly its use with adult recipients of a Phonak hearing aid with mild to moderate hearing loss. All data used in this study has been de-identified in compliance with Applicable Privacy Laws, including the United States' Health Insurance Portability and Accountability Act of 1996, as amended, and its implementing regulations (collectively, "HIPAA") (see 45 CFR § 164.514(b)(2)) and the Regulation (EU) 2016/679 of the European Parliament and of the Council of 27 April 2016 on the protection of natural persons with regard to the processing of Personal Data and on the free movement of such data and repealing Directive 95/46/EC (General Data Protection Regulation) ("GDPR"). Each client's data comprises two categories—fitting logs and data logs. Fitting logs encompass all information related to the hearing aid fitting found in a Target session. Conversely, data logs are collected each time the hearing aid connects to Target. The fitting state of the hearing aids at the end of each session is sent to a central server, where the fittings can be subjected to filtering and analysis.

Methodology

Data included in the present analyses were sourced from the United States, Canada, France, Germany, United Kingdom, Australia, and New Zealand and included fittings with Phonak Audéo Marvel, Paradise, Lumity, and Infinio RIC hearing aids. The target demographic for this study comprised adults aged 19 and above, who had a hearing loss ranging from mild to moderate, per the World Health Organization (WHO) definition (WHO, 2021). According to the WHO, mild (or slight) hearing loss is defined as having a four-frequency (0.5, 1, 2, 4 kHz) pure tone average (PTA) between 26-40 dB HL, and a PTA of 41-60 dB HL for moderate hearing loss. Adults with a mild degree of hearing loss represent 26.4% of the total fitting files included for analysis, and adults with a moderate hearing loss 47.7% (Figure 1).

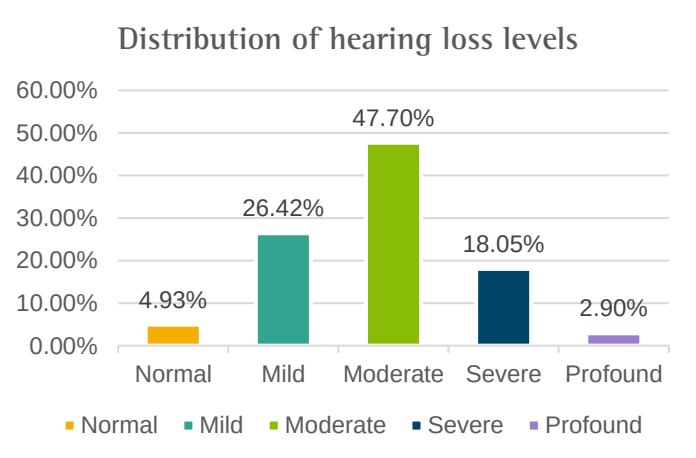

Figure 1. Distribution of hearing loss levels for adults aged 19 and above across Audéo Marvel, Paradise, Lumity and Infinio fittings.

A total of 1,607,345 fitting files of more than 891,000 unique clients were examined during this project. As there are specific best practice guidelines in the fitting and

programming needs of adults with severe to profound hearing loss and in all pediatric cases, these populations have been excluded.
This large-scale retrospective data analysis was conducted to analyze whether improvements in sound quality and connectivity, as introduced with the Infinio platform, may be linked to changes in fitting and hearing aid usage and thus have the potential to enhance the clients' experience.

Results

Daily wearing time:
Studies show that wearing time can illustrate a client's perceived benefit from their hearing aids (Houmøller, S.S., et al., 2022), with the overall hearing aid satisfaction tending to be higher in those wearing their hearing aids 6 or more hours per day (Wong, L.L., et al. 2003). When clients are comfortable wearing their hearing aids, they may have more confidence in their ability to hear, communicate and engage more with others, with hearing aid use being reported to enable better engagement in group activities and positively impact relationships (Abrams, H.B., Kihm, J., 2015).

As shown in figure 2, approximately 89% of adults are wearing their Phonak Infinio hearing aids more than 6 hours per day, with approximately 61% of adults wearing them between 10 and 16 hours per day.

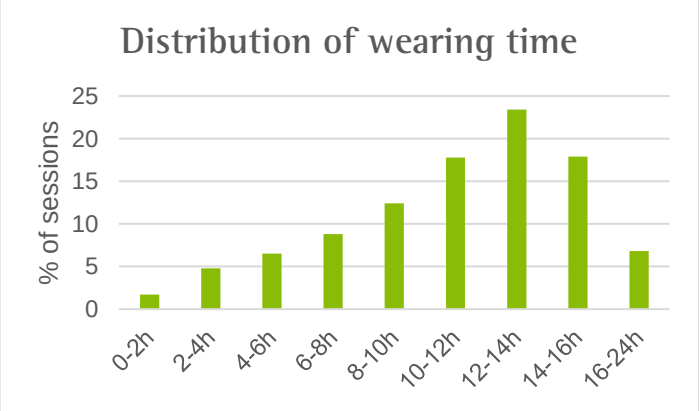

Figure 2. Distribution of the daily wearing time [% of sessions] in hours as logged by Infinio hearing aids worn by adults with mild to moderate hearing loss.

Furthermore, adults wear their Phonak Infinio hearing aids, on average, longer per day compared to Phonak Lumity and Paradise hearing aids (Figure 3). The increase in wearing time with newer technology may indicate that that clients experience more sustained benefit from their hearing aids.

Hearing well in a variety of listening situations is rated as highly important to hearing aid wearers and has a direct impact on their satisfaction of hearing aids (Kochkin, 2010). AutoSense OS™ for environmental classification helps to enable a seamless listening experience in every situation.

Examination of the data shows that Infinio fittings keep AutoSense OS 6.0 as the startup program in 99.8% of fittings, indicating both trust and satisfaction with how AutoSense OS classifies the correct listening environment at the right time, steering the right combination of features and functions for optimal sound quality.

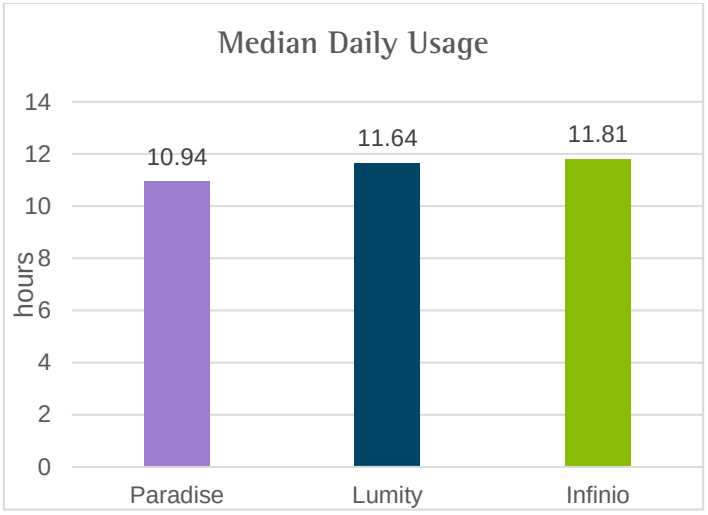

Figure 3. Median daily wearing time as logged by hearing aids worn by adults with mild to moderate hearing loss as a function of the platform.

The data showing increased wearing time with Phonak Infinio align with an earlier, prospective study in which new hearing aid wearers found the sound quality and overall listening experience with Infinio to be immediately acceptable (Stewart, E., et al., 2024). Observations like these help to provide evidence that clients will be satisfied when using APD 3.0 and default feature settings as recommended by the Target fitting software.

Fitting formulae
Fitting formulas prescribe the starting gains for hearing aid fittings that compensate for the client's hearing loss. Within Phonak Target, HCPs have several fitting formulas to choose from when programming hearing aids. Two of the most common independent options are NAL-NL2 (Keidser, G., et al., 2011) and DSL v5 (adult) (Scollie, S., et al., 2005).

However, the most commonly selected fitting formula is Phonak's Adaptive Phonak Digital (APD). One benefit of proprietary fitting formulas such as APD is that they can be routinely updated while taking proprietary signal processing of the hearing aids into account. When evaluating Phonak Target fitting data included for this analysis, 88% of adult fittings remain on the APD fitting formula, 8% switch to NAL-NL2, 2% change to DSL, while the remaining 2% choose others.

Infinio introduced APD 3.0 with a goal of improving sound quality from the first fit. As referenced above, an early study

examining the spontaneous acceptance of APD 3.0 in a group of new hearing aid users, revealed that 93% preferred Phonak Infinio over a key competitor (Stewart, E., et al., 2024).

Figure 4 shows that 44% of APD 3.0 fittings were not finetuned by the HCP, compared to 23% with DSLv5 and 29% with NAL-NL2. These trends are additional evidence that initial sound quality is immediately acceptable for the client, saving valuable time in the office.

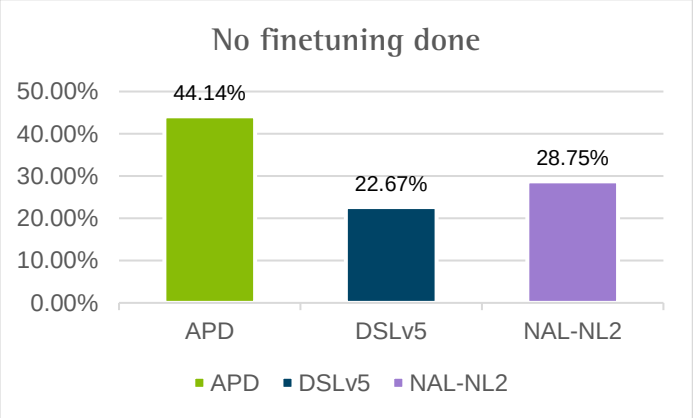

Figure 4. Percentage of Infinio hearing aid fittings not being fine-tuned by the hearing care professional via Phonak Target fitting software as a function of fitting formula.

Arguably, a hearing care professional may choose DSLv5 or NAL-NL 2 fitting formulas intentionally to conduct real ear measurements and thus apply fine-tuning. Interestingly, the selection of DSLv5 and NAL-NL2 fittings is not reflected in the client's overall wearing time. Across all Infinio performance levels, APD 3.0, and DSLv5 fittings remain on the same level, slightly ahead of NAL-NL2 fittings with regards to the average daily wearing time (Figure 5).

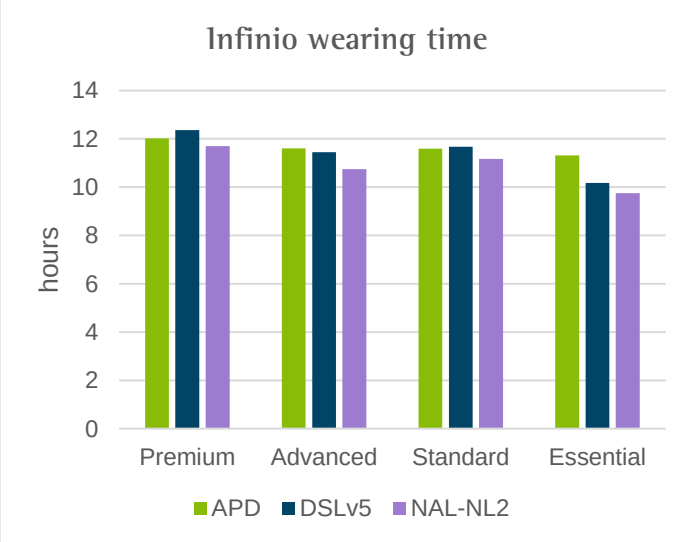

Figure 5. Median daily wearing time of Infinio hearing aids as logged by hearing aids worn by adults with mild to moderate hearing loss as a function of the fitting formula and hearing aid performance level.

In-clinic fitting sessions

Minimizing the time it takes for clients to reach high satisfaction with their hearing solution is key to improving the client experience, clinic efficiency, and ultimately saving time in the clinic workflow.

The first three months after initial first fit were analyzed across different platforms to understand the number of fitting sessions required during this time. To guarantee the analysis of an entire three-month period, only fitting sessions that started before November 30th, 2024, were considered.

With Infinio, 75% of the clients attended one fitting session less compared to Lumity, Paradise, and Marvel when looking at the three-month time window after each individual initial fit, providing further evidence that Phonak Infinio offers a high rate of first-fit acceptance among clients (Figure 6). Reduced follow-up appointments also contribute to overall clinical efficiency when fitting Phonak Infinio hearing aids (Figure 6).

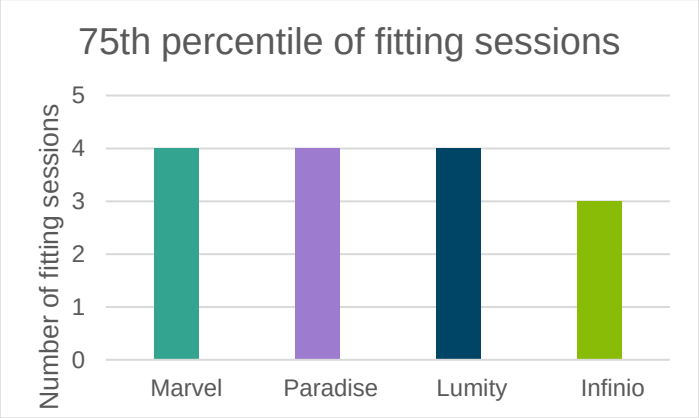

Figure 6. 75th percentile of fitting sessions required in the initial 90 days after first-fit for adults with mild to moderate hearing loss.

Bluetooth connectivity

Technology such as Bluetooth® streaming, is an important means of connection for people with hearing loss, especially for those who may be separated from others by health restrictions, immobility, or other circumstances. Innovations in Bluetooth connectivity and mobile apps enable clients to stream phone calls, music, TV programs, and more, directly into their hearing aids. MarkeTrak 10 found that clients who have Bluetooth as one of their hearing aid features are more satisfied with their hearing aids than those who do not have Bluetooth (Picou, E.M., 2020).

Phonak hearing aids are equipped with universal connectivity that allows instant compatibility to iOS and Android smartphones, and other Bluetooth® enabled devices. The new ERA chipset acts as the foundation for all wireless Infinio devices, enhancing stability, speed and efficiency of

the connection between the hearing aids and their connected counterpart.

Across the analyzed Infinio fittings, daily streaming of media at least once (including music & speech) and phone calls has increased by 5-8% compared to Lumity, with over 50% of clients now streaming daily (Figure 7).

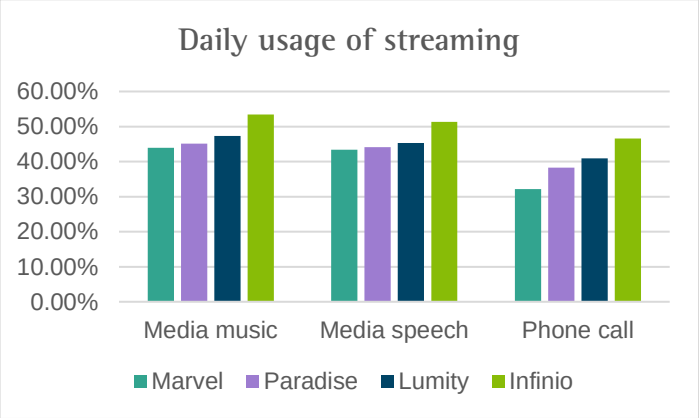

Figure 7. Usage of AutoSense OS streaming programs at least once per day as logged by hearing aids worn by adults with mild to moderate hearing loss.

In addition, the median time spent streaming has also increased with Infinio compared to previous platforms. On average, clients spend 36.5 minutes a day streaming with their Infinio hearing aids, compared to 32 minutes with Lumity, 33 minutes with Paradise and 32.7 minutes with Marvel (Figure 8).

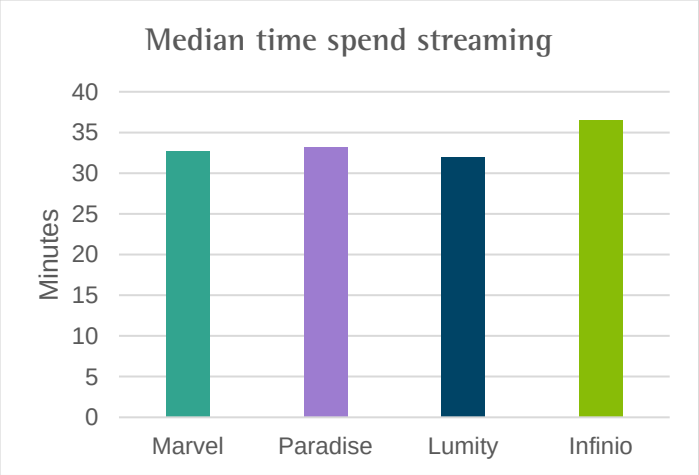

Figure 8. Median time spend streaming phone calls, media and speech in minutes as a function of the platform.

Figures 7 and 8 show that connectivity has become a tangible factor in one's daily listening needs, and the streaming experience with Infinio hearing aids may indeed be easier to manage than previous platforms, driving these increases in daily use rates.

Conclusion

Providing these insights from Phonak's archive of big data is intended to assist HCPs in making complex clinical decisions that help support successful client outcomes. Objectively, the data summarized here show that Infinio is being worn for longer than previous platforms, that use of the APD 3.0 prescription may reduce the need for fine tuning, and that time spent streaming wireless audio is increasing, which is evidence of how clients interact with their hearing aids and rely on them in a wide variety of situations. The results in the present analysis are in agreement with an earlier, prospective study conducted during the development and validation of APD 3.0, which found a high level of spontaneous acceptance for Infinio fittings. The data in this analysis also show reduced follow-up visits for Infinio fittings during the first three months after the initial fit. Taken together with the data suggesting reduced fine-tuning adjustments, the findings from this analysis suggest HCPs may enjoy more efficient clinical operation without sacrificing client satisfaction.

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