1000+ Perseo clients: precise first fit, high acceptance

Summary

The Perseo fitting formula was investigated in a large-scale study. More than 1000 real-life Perseo fittings were analyzed. The results show that the precalculated settings were close to the final settings. This indicates a high precision of the initial fit, and also a high level of spontaneous acceptance, which allows the hearing care professional to concentrate on more sophisticated aspects of fitting and counseling.

Introduction

Spontaneous acceptance is a key factor for successful hearing aid fitting. The accuracy of the audiogram-based precalculated hearing aid settings plays a fundamental role in achieving achieve spontaneous acceptance. When only minimal adjustments are required to satisfy a client's first impression of sound quality, loudness and speech understanding, then a positive and solid basis is established for the remainder of the fitting process. This allows the hearing care professional to focus on more sophisticated aspects of the fitting and counseling process to improve the long-term client satisfaction. In contrast, if the precalculated gain settings are way off the desired settings, initial disappointment with the new hearing instruments will overshadow all other subsequent aspects of the fitting. The precalculated settings might be derived from prescriptive gain formulae such as DSL or NAL, or from manufacturer's proprietary rules. To judge the quality of the precalculated settings of the Perseo hearing system, a retrospective study on a high number of real-life fittings has been done. The study aimed at (a) determining the level of spontaneous acceptance by analyzing the average gain adjustment performed, and (b) evaluating whether a high spontaneous acceptance is followed by utilization of more sophisticated aspects of the fitting process, e.g., the Listening Situation Manager which allows for tailoring the automatic program selection.

## More than 1000 real-life fittings

Data from regular real-life Perseo fittings were collected from a wide range of sites in Belgium and Germany. In total, 1028 fittings (1663 ears) from 69 hearing care professionals were analyzed. All available Perseo models were used. The hearing losses ranged from mild to profound, with a PTA of 51 dB. The mean age of the clients was 69 (SD: +/- 15 years). In 96% of all fittings, the proprietary "Phonak digital" fitting rule was used (Phonak digital ski slope: 3%, DSL[i/o] or NAL-NL1: 1%).

Accurate precalculation

The extent to which gain adjustments were required is illustrated in the figure below.

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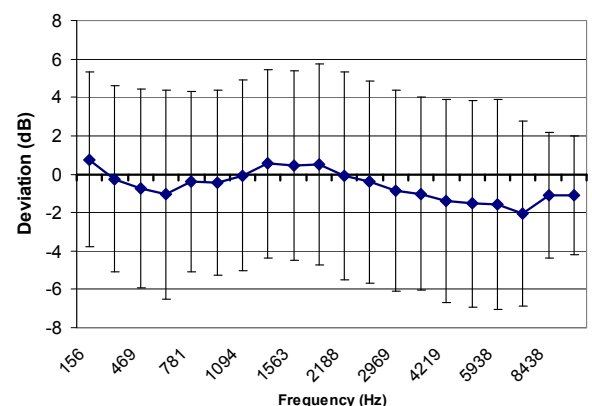
Shown is the mean gain deviation across all 20 frequency bands between the precalculated gain and the gain after fine tuning. The smaller the deviation, the better is the initial fit. The error bars show +/-1 SD across subjects. The average gain deviations are quite small across frequencies (-0.6 dB). There is just a slight trend towards decreasing the initial gain settings in high frequencies. For most frequencies, the deviations fluctuate around zero. This indicates that the initial fit is indeed appropriate and does not systematically provide too much or too little gain. The next figure gives more insight into this. It shows a scatter plot of average hearing loss vs. average gain adjustments.
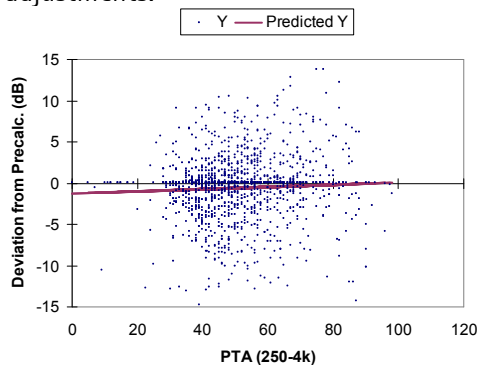
It can be seen that for mild hearing losses, there is a trend to slightly reduce gain (negative values). The portion of first-time users in this segment is likely to be higher, compared to the more severe losses. These clients are not used to amplification and often ask for gain reductions, especially in the highs. The next figure shows the variability (i.e., the standard deviation of gain adjustments) across subjects for different hearing losses. The results show that the greater the hearing loss, the higher the observed variability in gain
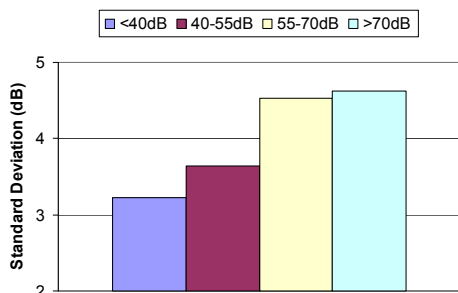

adjustments, i.e., more fine-tuning had to be done. The individual's "window of tolerance" for amplification narrows with increasing hearing loss, thus requiring more gain adjustments. In general, with an average standard deviation of less than 5 dB, the variability across subjects is quite small. In 32 % of all fittings, no gain adjustments had to be done at all. Thus, it can be concluded that the average initial acceptance of the precalculated gain settings was high.

Feedback: rarely
Another factor which impacts spontaneous acceptance is the occurrence of acoustic feedback. Assuming that using the feedback manager is the first action that is taken in case of feedback during fitting, feedback problems were rare, as the feedback manager was used in just 15 % of all fittings.

Usage of the Listening Situation Manager
Perseo allows for customization of the automatic program selection via the Listening Situation Manager. There are two basic modes: Audibility (default) and Comfort. The next figure shows how often these modes were chosen in the individual fittings.
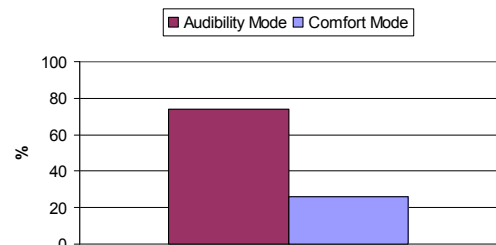
It can be seen that the comfort mode was activated in more than 25% of all fittings. This indicates that indeed more sophisticated aspects of the fitting process were considered to further improve the satisfaction of the client. This requires, however, that the first fit is accurate and spontaneously accepted by the client, so that the hearing care professional is not absorbed by finding the desired gain settings but can concentrate on other important aspects of fitting and counseling.

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