

Pediatric Whitepaper

child
friendly
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care

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Development of a Pediatric Fitting Mode in Genie

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Abstract

Provision of “Child-Friendly” hearing care goes beyond development of pediatric focused products and programs. The fitting protocol used when fitting children with hearing instruments typically differs from that used with adults. In a pediatric fitting, the hearing healthcare professional may be working with audiometric data of varying formats, a different fitting rationale, different assumptions concerning how automatic features should be set, and a different approach to verification. A fitting flow that works well with an adult may not be ideal with a child.

The launch of the Safari pediatric hearing instrument line was accompanied by the creation of a pediatric fitting mode within Genie (Oticon’s fitting software). This fitting mode was created by focusing on the needs of the child with hearing loss and their hearing healthcare professional. The purpose of this article is to describe how this was achieved and provide an introduction to the new pediatric fitting flow in Genie.



The Goal

The development or modification of fitting software presents a unique set of challenges. Human beings are naturally creatures of habit. Fitting software is something that is typically used on a daily basis. It is one of the few constants throughout the day. Hearing instrument technology, however, is constantly changing and the hearing health-care professional faces a constant barrage of new products and developments.

Fitting software must therefore evolve as new products emerge. Manufacturers are faced with a delicate balancing act. There is safety and certainty in the familiar, but the potential for improvement and increased benefit in the new. In developing fitting software, a middle ground must be found to ease the transition while accommodating the new technology. Thus a primary objective in developing a pediatric fitting mode was to ensure it had a familiar feel to it, while including all the changes and features necessary to improve the flow when working with a child.

Another important aspect when developing fitting software relates to the varied backgrounds and experience levels of the users themselves. This variety may be even more prevalent among professionals working

with children. Consider the needs and experience of a pediatric audiologist working in a large metropolitan hospital versus that of an audiologist working in a rural private practice. The latter may primarily work with adults and have a few pediatric patients on their caseload, the former works with children most of the time. While their goal is similar, the means for obtaining it may differ. An additional objective was to ensure that most professionals would feel comfortable using the software and at the same time not be constrained in terms of flexibility to configure the software to suit their individual needs.

The Process

In the development of the Genie pediatric fitting mode, the pediatric hearing health-care professional was viewed as the most important resource. What looks good on paper may not necessarily be realistic in practice especially when working with busy children. Therefore the first step was to get input from real, live professionals. What is your day like? What approach do you take when fitting children? What do you like in current fitting software? What would you like to see?

Two focus groups were conducted by an external consulting group. The groups



consisted of professionals involved in the fitting of hearing instruments to children. However their backgrounds were varied in terms of practice setting, number of children versus adults seen, and experience with Oticon products. Behind one-way mirrors, project members were able to get a glimpse of a “day in the life” of a pediatric audiologist.

The information collected from these groups proved invaluable. From a big picture standpoint, it helped the project team to develop “pillars” on which the pediatric fitting mode would be developed. These pillars included “Familiarity”, “Flexibility”, “Efficiency”, and “Certainty.” Each of these pillars will be discussed in more detail in the results section.

The team then faced the difficult task of translating this information into useable data for the purpose of developing the pediatric fitting mode. A unique approach was taken through the development of “personas” and “use cases”. Along the lines of “to catch a fish you need to think like a fish”, the team wanted to personalize our approach. By thinking like a pediatric audiologist and focusing on their specific needs, the goals would more readily be achieved.

While several personas were developed, there were two that ultimately were focused on throughout the project, “Catherine” and “Maria”. Their respective characteristics, assumptions, and needs are outlined in Table 1. Any similarities between these individuals and any real-life audiologists are purely coincidental! These personas were developed from the imagination of project members. The team felt that development of a fitting flow that could meet the needs of these two personas would be considered a success. “What would Catherine think?” and “What would Maria do?” were commonly heard questions in meetings.



Along with the personas, a variety of use cases were developed and analyzed. Use cases were created to reflect the types of patients these individuals would encounter during daily practice. The approach taken with a newly diagnosed infant with hearing

loss can vary from that obtained with a teenaged, experienced hearing aid user. Not only did the fitting mode have to accommodate different “personas” but also the variety of “use cases” to which the software would be applied.

Maria	Catherine
<ul style="list-style-type: none"> • Am I doing this right? 	<ul style="list-style-type: none"> • How can I get the software to do what I want it to do quickly? I know what I’m doing and have strong opinions on how children should be fitted.
<ul style="list-style-type: none"> • Recently purchased a private practice that primarily serves adults, but also some children. 	<ul style="list-style-type: none"> • Works in a Children’s Hospital, 100% pediatric caseload. Follows “best-practice” guidelines published by professional organizations.
<ul style="list-style-type: none"> • Tests children as young as 2-3 years of age using CPA. Otherwise, the audiometric data is typically provided by a hospital across the state (electrophysiologic data, VRA data, etc.). 	<ul style="list-style-type: none"> • Involved in all aspects of fitting including diagnosis and counseling. Attends two to three pediatric focused conferences a year.
<ul style="list-style-type: none"> • She has one office assistant and needs to manage all aspects of her practice including marketing and reimbursement. 	<ul style="list-style-type: none"> • Supervises Au.D. students and is guest lecturer at a local university.
<ul style="list-style-type: none"> • Attends the state AAA meeting each year, sometimes goes to the national AAA conference. 	<ul style="list-style-type: none"> • Feels it is important to stay current on all issues concerning children with hearing loss.
<ul style="list-style-type: none"> • Uses computers when necessary for work. Outside of work, uses a basic cell phone and digital camera. Her own children are a great resource when she has technology troubles. 	<ul style="list-style-type: none"> • Very comfortable with technology, can’t live without her Blackberry.
<ul style="list-style-type: none"> • Primarily works with one manufacturer. 	<ul style="list-style-type: none"> • Primarily works with two manufacturers.

Table 1. Characteristics associated with the primary personas created in the development of the Genie pediatric fitting mode.



Viewing the pediatric fitting from the perspective of different personas and different patients allowed the group to identify issues within the previous version of Genie that could be changed. Potential screenshots were created that incorporated the ideas developed by the team. At this point, several pediatric audiologists were again sought for input. These audiologists were provided with screenshots and use cases and asked to “fit” the child using the current version of Genie and the proposed version that include a pediatric fitting flow.

The team focused on the sequencing used by the audiologists as well as the number of “clicks” needed to complete the fitting. The sequencing data and feedback from the audiologists was used to further refine the fitting flow and a beta version was developed. A different group of audiologists from several countries was then asked to evaluate the flow using actual software and hearing instruments. These visits provided the team with some additional data that was used to fine tune the fitting software.

The Result

The approach described above resulted in a new version of Genie that remains familiar while incorporating new features and a new flow that result in the ability to fit a child more efficiently and confidently. Audiologists also have greater potential to personalize the assumptions inherent in the fitting software. Following, some of the major changes are reviewed.





Familiarity

The pediatric fitting mode is by default selected when fitting an instrument from the Safari product line. The overall structure and feel are very similar to what is seen when working with an adult (see Figure 1).

Access to the major stages of the fitting is achieved in the same way. Graphical changes

are subtle, yet obvious enough to know one is in the pediatric mode. The overall flow is identical (Selection to Fitting to End Fitting). Within these steps, however, the flow has been modified to accommodate the unique aspects inherent in a pediatric fitting. For example, the “RECD and REUR” link is located higher up in the task panel as this application is more frequently applied in pediatric fittings.

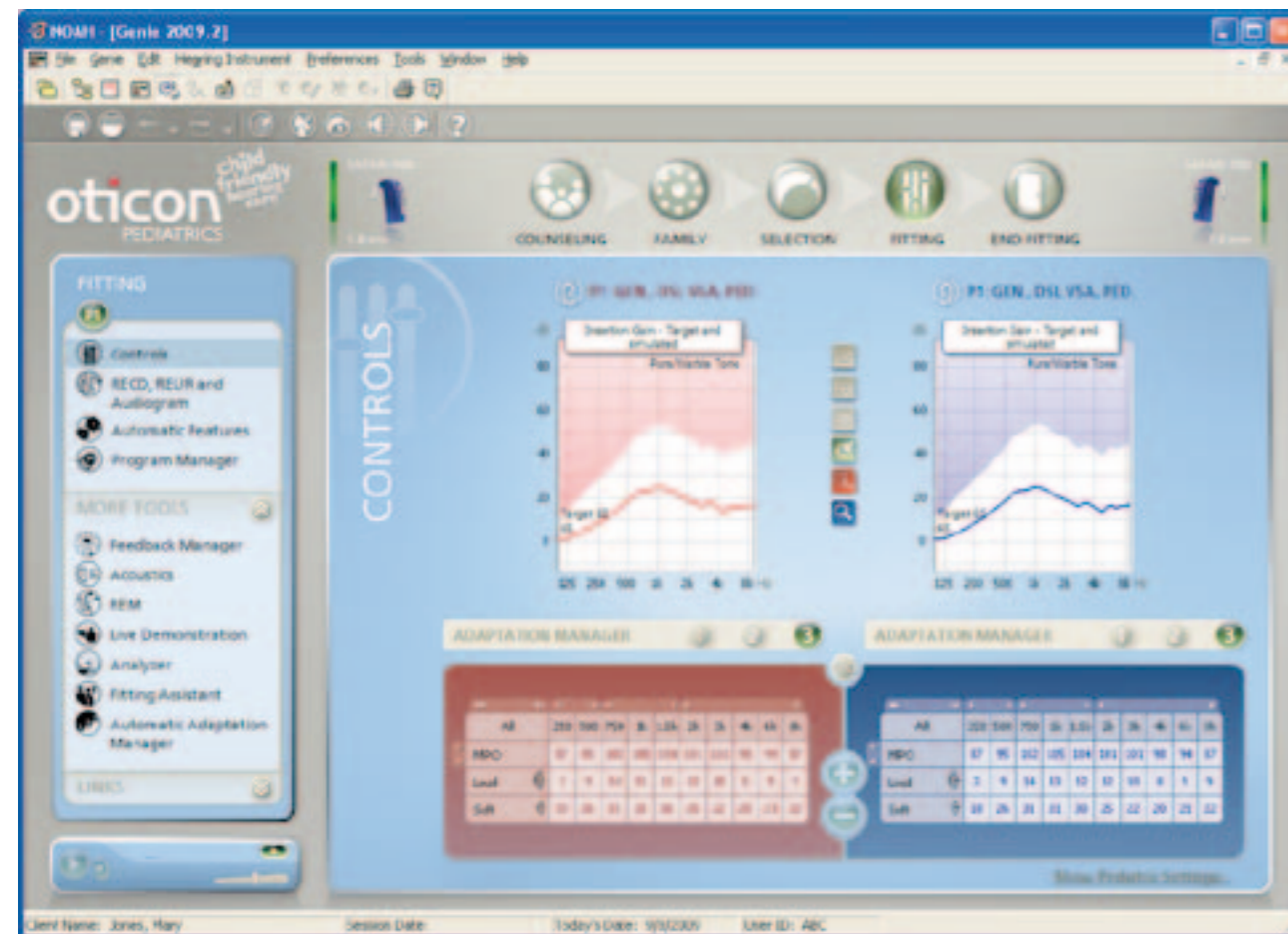


Figure 1. Fitting screen in the pediatric fitting mode. The overall structure and layout is similar to that in the adult fitting mode.

Flexibility

Pediatric fittings require a greater degree of flexibility in terms of hearing aid settings than typically seen with adults. Features such as directionality and digital noise reduction are typically enabled for adults. With children, however, the appropriate settings not only differ as a function of age, but can also differ according to the beliefs and experiences of the audiologist. As was evident from the focus groups and subsequent meetings with audiologists, there is no clear cut consensus concerning at what age certain features should be enabled. Even within a given practice, views are often divergent.

A given set of default settings would not be acceptable to all. Of course something has to be default, however it was important that this default could be customized based on the preferences of the audiologist.

Figure 2 shows the default settings for a number of features. Not only can these default settings be changed as a function of age, but the age brackets themselves can be manipulated. Once personalized, the new defaults are applied going forward until or unless the audiologist decides to change them.



Figure 2. Default pediatric hearing aid feature settings can easily be set according to the hearing healthcare professional's beliefs.



Efficiency

A frequent point made during the initial focus groups was the desire to be able to complete the fitting using “fewer clicks”. The ability to define pediatric default settings was one method for reducing the number of necessary clicks. Audiologists no longer need to change the noise reduction and directionality settings manually for most patients. Age-based settings are automatically applied based on the audiologist’s preferences.

Tasks that are frequently conducted during a pediatric fitting (e.g., RECD, entry of audiometric data in format other than dB HL) are easier to accomplish and the links are located in more prominent locations. Further customization of preferences (e.g., expanded fitting panel by default, SLPogram as default view) is possible providing increased fitting efficiency.

Certainty

Many of the changes implemented in an effort to provide greater flexibility and efficiency also result in greater “Certainty” for the audiologists. Several new pop-up boxes have been implemented so the audiologists can get a quick overview of how the hearing instruments have been programmed.

Figure 3, for example, is an example of a pop-up window the audiologist would see during the initial fitting of the child. As long as the audiologist agrees with the settings, there is no need to click around the software to verify that noise reduction and directionality are turned off for this infant.

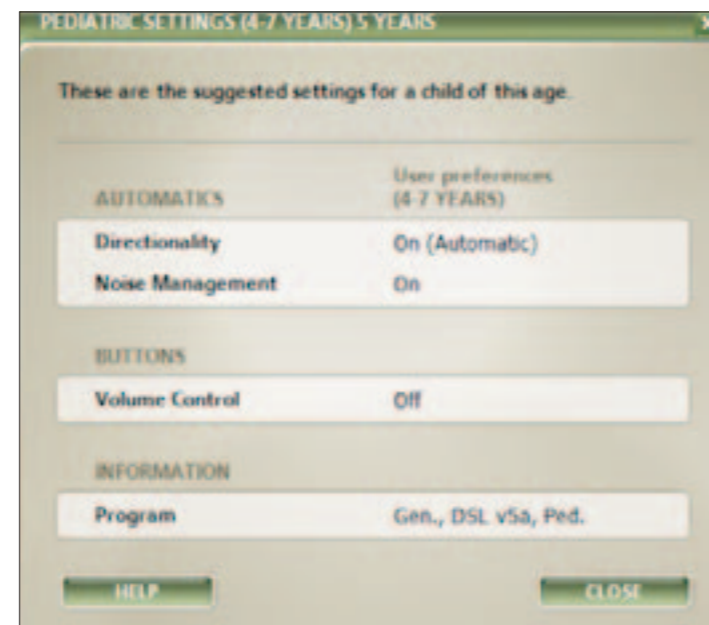


Figure 3. The audiologist is provided with the default settings upon creation of a new fitting.

A more detailed snapshot of the hearing instrument settings can be seen at any time via one click (see Figure 4).

This provides a quick overview the audiologist can use to confirm the settings are as intended. During subsequent visits, the

audiologist is prompted when the child has moved from one age group to another in terms of default settings. The audiologist is provided with an option for applying new settings (e.g., enabling directionality in the older child) or disregarding the recommendation directly from the pop-up box.



Figure 4. The audiologist can quickly confirm a number of settings via one click. This type of window also pops up during subsequent visit when a child moves into the pre-defined age range.



The entry of audiometric data has been simplified and the interface has been made more intuitive. As greater number of children receive diagnostic services and rehabilitative services in different facilities, it becomes critical that data is entered

appropriately. The audiologist first chooses the method for obtained thresholds followed by the transducer used and then whether or not any needed corrections have already been applied (e.g., dB nHL vs dB eHL).

In Figure 5, for example, a tone burst ABR was used to obtain audiometric data using insert foam tips. In this case, the audiologist has already transformed the electrophysiologic data to dB eHL so the fitting software does not apply this correction.

Summary

The release of the Safari product line is accompanied by the development of a pediatric fitting mode in Genie. The pediatric fitting mode was designed to accommodate the unique challenges faced by pediatric audiologists and their patients. The fitting software is more flexible in accommodating the perspective of the individual audiologist and increases the confidence that the hearing instruments are set as intended. This can be accomplished using fewer clicks resulting in a more efficient fitting. Importantly, the overall structure and feel of Genie have remained the same and pediatric audiologists will not need to learn a new fitting software.



Figure 5. The audilologist can enter ABR audiometric data in either dBnHL or dB eHL. Corrections would be automatically applied to the data entered.



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It takes a truly dedicated approach to help children with hearing loss achieve their full potential. That's why we deliver the solutions and services professionals and caregivers need to provide children the opportunities they deserve. This is what *child-friendly hearing care* is all about.