

THE Hearing Review

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Hearing Health and Its Role in Well-being



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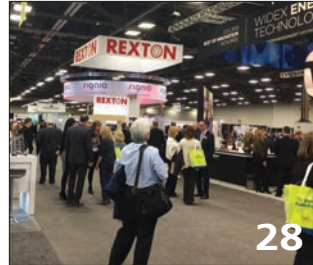
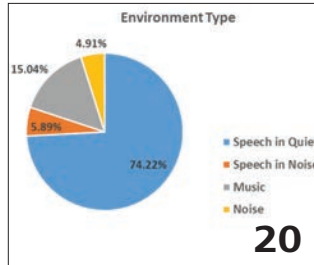
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The goal of this position statement from an expert panel assembled by Phonak is to propose a model of well-being that would be easy to use in clinical audiology practice and considers the domains of socio-emotional, cognitive, and physical well-being as core dimensions of well-being. While hearing loss and its associated communication challenges can indeed impact these core well-being dimensions, growing evidence shows that hearing rehabilitation can provide benefits in the same three domains.

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The Decade of Hearing Care

If you're thinking about getting out of the hearing care business because of all the negatives: Don't. This was a key message that Starkey Hearing Technologies President Brandon Sawalich emphasized during the company's Innovation Expo in January, and again more recently in a panel discussion I took part in during the Elite Hearing Network Summit in February. Sawalich points out there are over 466 million people today worldwide with hearing loss, and by 2050 there will be over 900 million. When looking at the active aging population during the next decade, the fastest growing segment will be people age 85+, with a larger population than children under age 5. The second-fastest growing population will be people age 100+.



"[Some professionals] are thinking 'The industry is changing, or I need to get out, or business is tough.'" said Sawalich at the Starkey Expo. "Yes, it's tough: competition is tough and business is tough. We get that. But there were about 17 million hearing aids sold [worldwide in 2019]... If you're thinking about getting out of the industry over the next decade, you should know the numbers tell a different story.

Taking it from a different perspective, if you're looking at or thinking about expanding, the numbers tell the right story... So, we recognize that we have the opportunity and the responsibility [to provide hearing care]—and this opportunity is really limitless... We have to do what we need to do to serve more patients, to help more people."

Sawalich is correct: Even given factors like the rise of third-party administrators (TPAs) and the upcoming class of over-the-counter (OTC) hearing aids, the next decade will be the most exciting—and prosperous—in industry history, and you won't want to miss it. This will be the decade in which hearing healthcare comes of age and becomes a recognized part of general healthcare.

The cover story in this month's edition, authored by 17 prominent audiologists and researchers who were part of an expert panel assembled by Phonak, is a terrific summary and literature review that details the reasons *why* hearing healthcare is poised to vault into the limelight. It shows how hearing influences socio-emotional, cognitive, and physical well-being, while highlighting the growing scientific evidence that hearing rehabilitation provides *huge benefits* in those same three domains.

But, really, will all this scientific data hurtle us to the forefront and change everything? No. But money will. There are staggering social and economic costs associated with degraded communication, social isolation, loneliness, depression, cognitive decline and dementia, and loss of independent living. As our population continues to get older and hearing loss continues to be strongly associated with these and other chronic conditions, research into improved communication—with audiology and neuroscience at the helm—should emerge as one of the most obvious and relatively easy/economical fixes.

Why will this be the decade of hearing healthcare? Because healthcare is the fourth-largest industry in the United States, with a whopping \$8,608 in per-capita spending, representing about 8% of our gross domestic product—a percentage many economists think is at or approaching a maximum threshold. We have a solution: better hearing, better communication and more cognitive stimuli, better patient compliance and (literally) brain function, reduced loneliness and depression, greater productivity for older workers, people being able to "age in place" more easily, reduced falls, and better physical well-being. As this month's cover story points out, the benefits of better hearing and the positive consequences of aural rehabilitation are "no-brainers" for medicine and general healthcare to embrace.

There are rough waters ahead. No doubt. We're going to have to sort through TPAs, OTCs, and probably Medicare. But if you're successful because you're doing a great job serving people with hearing loss, this is going to be a *fantastic* decade for you. There's much more work to do and many more people you can help. The best is yet to come.

Karl Strom, Editor-In-Chief

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■ NationsHearing Rebrands to NationsBenefits; Launches New Website

NationsHearing, LLC, a hearing aid and services benefit, announced that the company has completed a redesign and rebrand to NationsBenefits. According to the announcement, the rebrand expands the focus of the company's customizable solutions, broadens the scope of clinically focused services for consumers, health plans, partners, and providers, and includes a new logo, positioning, and website.

NationsBenefits' new branding reportedly enables the company to "stand out in a rapidly changing industry."

"We made it a priority to rethink our name and our brand identity," said Michael Furstenberg, chief marketing officer at NationsBenefits. "Rebranding to NationsBenefits illustrates we're evolving to meet more of the needs of our customers in today's changing environment, and it signi-



fies how far our company has come since its founding in 2015."

The company's refreshed logo and revamped website, www.nationsbenefits.com, feature a modern design and emphasizes its ability to "surpass traditional benefit management programs with an outcomes-based model that delivers cost savings to health plans and better overall health of their members."

The company's mission is to provide best-in-class healthcare management solutions to managed care organizations and to drive improved, long-term health outcomes for customers through comprehensive supplemental benefits, innovative technology-based solutions, and exceptional service delivery.

■ South Dakota Introduces Two Bills Related to Deaf Education

In response to an investigative report in the *Argus Leader* alleging that South Dakota has ignored the needs of deaf children in the educational system, two new bills intending to address the issues have been introduced by legislators.

State Representative Erin Healy, D-Sioux Falls, sponsored House Bill 1228, which modifies the age range for South Dakota's *Language Equality and Acquisition for Deaf Kids (LEAD-K) Law's* language and developmental literacy milestones from birth to age 5 to birth to age 21, regardless if the child receives special education or related services.

LEAD-K has a controversial history and is part of a national effort that its proponents say will ensure children with hearing impairments have strong language skills when they start school. It became something of a flashpoint among those who are deaf and hard of hearing, with the AG Bell initially opposing it and then reconciling after language was introduced that endorsing



parent(s) rights to select the language they want (ASL, English, or both) for their child.

Senate Bill 117 would mandate that the state's Department of Education create certain programs for deaf and hard-of-hearing children under the 1993 Deaf Child's Bill of Rights. The law currently reads that the department "may establish a program and policy to be disseminated to all school districts and other local educational agencies which promote the education of deaf and hard of hearing children." The word "may" would be modified to "shall."

News cont on p 33

■ Virginia Bill Would Mandate Hearing Coverage for Children

A new bill sponsored by Virginia Senator Bill DeSteph would require insurance companies to offer hearing aid coverage for children, according to an article published on the WAVY-TV website.

SB 423 provides coverage for hearing care services provided by a licensed audiologist, as well as hearing aids, up to \$1,500, every 2 years.

Crystal Dupilka, a woman profiled in the article whose son, Clay, is hearing impaired, said she's spent \$3,000 in out-of-pocket costs for Clay's hearing aids.

According to WAVY, DeSteph estimates the legislation would help approximately 400 children a year in Virginia.

"It's a lot cheaper to give them hearing aids...[than] wait and have to spend \$40,000 a year for accommodations for speech therapy," DeSteph was quoted as saying in the article.

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Balance

Well-Hearing is Well-Being

A Phonak position statement about why hearing healthcare is vital for healthy living

By CHARLOTTE VERCAMMEN, PhD; MELANIE FERGUSON, PhD; SOPHIA E. KRAMER, PhD; MARKUS MEIS, PhD; GURJIT SINGH, PhD; BARBRA TIMMER, PhD; JEAN-PIERRE GAGNÉ, PhD; HUIWEN GOY, PhD; LOUISE HICKSON, PhD; INGA HOLUBE, PhD; STEF LAUNER, PhD; ULRIKE LEMKE, PhD; GRAHAM NAYLOR, PhD; ERIN PICOU, PhD; SIGRID SCHERPIET, PhD; BARBARA WEINSTEIN, PhD; ANGELA PELOSI, MAuDA

The goal of this position statement is to propose a model of well-being that would be easy to use in clinical audiology practice and considers the domains of socio-emotional, cognitive, and physical well-being as core dimensions of well-being. While hearing loss and its associated communication challenges can indeed impact these core well-being dimensions, growing evidence shows that hearing rehabilitation can provide benefits in the same three domains.

Editor's note: In November 2019, Phonak convened a group of researchers and experts to discuss well-being. How can we define well-being, especially in a hearing health care context? Can we formulate research directions to guide future work, aimed at improving quality of life of people with hearing loss? This paper is a first reflection of this work. "Well-hearing is Well-Being"™ is a trademark of Phonak.

Hearing loss extends beyond hearing sensitivity, in many ways. The complexity of hearing loss relates to the complexity of life. Meetings, restaurant visits, family parties, etc. are all often set in noisy or reverberant surroundings. To hold conversations in these challenging situations, it is generally recognized that listeners rely on peripheral hearing sensitivity (reflected by a pure-tone audiogram), central temporal sensitivity (the accuracy and efficiency by which auditory information is encoded, processed, and integrated throughout the auditory pathway), and cognitive skills.^{1,2} When bottom-up signal processing degrades, such as through hearing loss, top-down cognitive processing becomes more important.³

The complexity of hearing loss also relates to its impact. Hearing is in many ways a social sense, and hearing loss can have a fundamental impact on communicating with others, and connecting to them. Hearing is also an emotional sense, and hearing loss can change how we enjoy social gatherings, theater, music, and how we perceive emotions. Hearing loss can also affect the ability to monitor changes in the acoustical environment, potentially impacting a sense of safety or security.

In other words, hearing loss can have an impact on what we intuitively would refer to as "well-being." But can we put a definition on well-being, with an emphasis on well-being in a hearing healthcare context?

Defining Well-being

Well-being is a very personal and multi-dimensional concept.⁴ It seems to inherently

relate to things we value in life. For one person it can be happiness, independence, or staying active. For another person it can be social participation, satisfying relationships with family and friends, or achievements in the workplace. One's definition of well-being is likely to be fluid and can change throughout life. At times when we are confronted with physical health problems, physical well-being can take on a more prominent role. At times when we are in good physical shape, other aspects of well-being may be more important.

The aim of this paper is to propose a model of well-being that would be easy to use in clinical audiology practice. In this model, we consider socio-emotional, cognitive, and physical well-being as core dimensions of well-being. These three core dimensions are founded on the World Health Organization (WHO)'s constitution, which since 1948 describes health as "a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity."⁵ The definition hasn't changed since 1948.⁶ In 1986, the Ottawa Charter for Health Promotion did add that "To reach a state of complete physical, mental and social well-being, an individual or group must be able to identify and to realize aspirations, to satisfy needs, and to change or cope with the environment...Health is a positive concept emphasizing social and personal resources, as well as physical capacities."⁷

While hearing loss and its associated communication challenges can indeed impact these core well-being dimensions, growing evidence shows that hearing rehabilitation can provide benefits in the same three domains. This will be further discussed in the following sections of this paper. By also identifying research directions and applications for clinical practice, we want to further explore these associations and encourage hearing care professionals to discuss the multi-dimensionality of hearing loss and well-being in audiological care.

Socio-emotional Well-being

Human beings are social creatures. Above many things, we value connectedness. For good reason, it seems. Increasing evidence demonstrates that having supportive social ties is associated with better health outcomes, such as longer life expectancy,⁸ better physical,^{9,10} and better mental health.¹¹ One of the longest longitudinal studies ever conducted even suggests that cognitive and emotional health in late-life may be mediated by successful relationships—with significant others, at work, or in a community—around midlife.¹²

If social connectedness is good for the brain and the body, how do hearing and hearing rehabilitation fit in? One of the growing concerns related to hearing loss is the association with a smaller social network,^{13,14} feelings of loneliness,¹⁵⁻¹⁸ restricted interpersonal communication behavior,¹⁹ and an impact on the perceived quality of relationships with others.^{17,20,21} What if this socio-emotional burden associated with

hearing loss acts as a mediating factor, negatively impacting long-term health outcomes? What if treating hearing loss could turn the situation around and allow us to live longer and healthier?

To date, there are no clear answers to these questions. One longitudinal study showed that a sample of hearing aid adopters and non-adopters spent equal amounts of time engaged in solitary activities, such as watching TV or reading.²² These results suggest that hearing aids may not benefit social engagement. However, in the same study, individuals with hearing loss reported a lower perceived socio-emotional impact of hearing loss while wearing hearing aids.²²

The difference between actual (objective) and perceived (subjective) social impact or benefit may in fact be crucial. It has been suggested that feelings of social isolation or social engagement rather than objective measures may be predictive of health outcomes.²³ While there is a need for further research on

hearing aid use, long-term health outcomes, and different measures of social engagement, the self-perceived social benefits of hearing aid use seem evident to hearing aid adopters,²⁴⁻²⁶ and their communication partners.^{20,27}

Indeed, more and more research shows that involving communication partners in hearing rehabilitation is key. By applying such a family-centered care approach, the needs of all individuals involved in communication can be acknowledged and addressed.^{28,29} For persons with hearing loss, perceived social support is linked to being successful and satisfied with hearing aids,^{30,31} but also to seeking help for hearing loss in the first place.³²⁻³⁴ This is most likely due to the fact that communication partners, such as spouses, can experience difficulties because of the hearing loss of their partner as well—a phenomenon referred to as “third party disability.”^{35,36}

Additionally, people can deal with hear-



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Hearing care providers are uniquely positioned to raise awareness, and put hearing loss and hearing rehabilitation in a much broader context. Therefore, they can play a key role in changing the conversation from “needing a hearing aid because you do not hear well,” to a conversation about what hearing and hearing rehabilitation can truly mean for an individual in the broader context of healthy living.

ing loss in different ways, depending on personality traits, co-occurring life events, and social or environmental influences.³⁷ On the one hand, people may apply strategies to actively manage hearing loss, such as using hearing aids and/or communication strategies (engaged coping). On the other hand, people may avoid addressing hearing loss, for example by denying or minimizing their hearing problems, withdrawing from social situations, or withdrawing within social situations (disengaged coping),¹⁸ sometimes mediated by (self-)stigma.^{37,38} This may lead to social isolation and loneliness.

However, when persons with hearing loss and their communication partners apply aligned coping strategies (eg, by working together on dealing with and managing hearing loss), adjusting to hearing loss and hearing aids can be facilitated.²⁰ Audiologists and hearing care professionals can foster this alignment of coping strategies by providing information and support to both the person with hearing loss and his/her communication partners.

Cognitive Well-being

Cognitive well-being and healthy aging are hot topics for policy makers, researchers, and clinicians. Population aging is a fact. In many parts of the world, it is expected that one-third of the population will be older than 60 years of age by 2050.³⁹ About a third of individuals in this age range will develop a hearing loss that interferes with daily life functioning.⁴⁰ Adding on to it, growing evidence shows that persons with hearing loss are more at risk of developing clinically significant cognitive problems than their normal-hearing peers.⁴¹⁻⁴⁴

There is no consensus yet on why hearing loss and cognitive decline are associated.

Recent data suggest that it may be a combination of different underlying mechanisms.⁴⁵ One of those mechanisms could be a common cause, affecting both hearing and cognition. Another mechanism postulates a short-term relationship between both, as a decline in hearing sensitivity requires compensatory cognitive resources that are then no longer available to perform other tasks. There is also the possibility of a long-term relationship: sensory deprivation due to hearing loss may affect cognition because of a prolonged period of reduced brain stimulation,⁴⁵ or by interacting with other risk factors for developing cognitive problems, such as a smaller social network or depressive symptoms.⁴⁶

Causal hypotheses imply that treating hearing loss—for example by amplifying the auditory signal through hearing aids—could have a positive effect on cognition, protecting against or slowing down cognitive decline. To date, only a few longitudinal studies are available on this topic and they show mixed results.^{47,48} About half of the studies show a positive effect of treating hearing loss, while the other half show no effect of hearing aid use on long-term cognitive outcomes.⁴⁷ Randomized clinical trials on this topic are still ongoing⁴⁹ and will shed more light on this subject in the upcoming years. In the meantime, the promising emerging evidence that hearing aids may delay the onset of cognitive decline⁵⁰⁻⁵² urges for the clinical recommendation to adopt hearing aids early in the course of hearing loss.

Also, the immediate, short-term effects of hearing aids on cognition should not be underestimated. Wearing hearing aids during a listening task allow listeners with hearing loss to do better on a secondary task (ie, a task performed at the same time).⁵³⁻⁵⁶ Keeping in mind that a person’s individual cognitive

capacity^{56,57} or experience with hearing aids (eg, experienced versus first time users⁵⁷) may also play a role, these dual-task studies suggest that making sounds more audible can make listening less effortful. Reducing listening effort could free up cognitive resources for purposes other than listening,⁵⁸ and could potentially also reduce feelings of fatigue.⁵⁹

As the generalizability of laboratory studies on listening effort remain unclear, novel methods to measure hearing aid benefits in the field could provide more insights. During Ecological Momentary Assessment, for instance, hearing aid wearers are asked to monitor their experiences in real-time. By filling in a survey through an app, listeners can indicate how effortful listening is in different situations, or how they would rate their hearing performance, multiple times per day.^{60,61}

Physical Well-being

To navigate the world, we continuously try to stay aware of our surroundings by integrating information that comes in through all the senses.⁶² Our sense of hearing, for example, contributes to a sense of environmental awareness: by processing and interpreting spatial information in sounds, listeners are able to monitor changes in the acoustical environment.⁶³ Hearing loss can make this a lot more challenging, as it introduces difficulties to segregate and localize sound sources,⁶⁴ but also to detect subtle sounds, such as approaching footsteps or the splashing sounds from a wet and slippery floor.

Therefore, it is likely that listeners with hearing loss spend more effort maintaining awareness of their surroundings than listeners with normal hearing. Similar to compensating for reduced speech intelligibility by “filling in the gaps,” extra effort spent on auditory tasks like spatial awareness may compromise the availability of cognitive resources for other purposes.⁶⁵ In an older more vulnerable population, it has been hypothesized that this could impact skills such as postural control.⁶⁶

Postural control is a complex motor skill that allows us to achieve, maintain, and restore balance. It prevents us from falling down and allows us to control our movements.^{67,68} To achieve postural control, we rely on a multisensory feedback system that integrates auditory,⁶⁹ visual, vestibular, and proprioceptive information.⁷⁰

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More and more research shows that older adults with hearing loss are significantly more at risk of falling than their normal-hearing peers.⁶⁶ As falls often result in detrimental outcomes—such as loss of confidence, serious injuries, or even mortality⁷¹⁻⁷³—it is of high interest to identify and address risk factors for falling, such as hearing loss.

In addition to the cognitive effort hypothesis, it is known that postural control is especially challenged when there is a vestibular problem. Given the close proximity of the vestibular and auditory systems, factors such as infections or aging may impact both at the same time.⁶⁶

Interestingly, some studies show positive effects of hearing aid use on postural stability and balance in individuals with hearing loss.⁷⁴⁻⁷⁶ Other studies suggest that this may only be the case for persons with clinically significant vestibular problems.^{76,77} Nonetheless, well-fitted hearing aids can increase access to subtle sounds, fostering a listener's awareness of changes in the environment. Hearing-aids could thus increase feelings of safety or security, giving people the confidence to maintain an active and healthy lifestyle.

To date, however, almost no studies have investigated long-term physical health outcomes following hearing aid adoption. Holistic intervention programs aimed at improving the physical and social well-being, as well as the hearing and health-related quality of life in persons with hearing loss, are currently under investigation^{78,79} and show promising pilot results.⁸⁰

Potential Research Directions, and Applications in Clinical Practice

The goal of this paper was to give a high-level overview of current scientific evidence linking hearing and hearing rehabilitation to the different dimensions of the “Well-Hearing is Well-Being” model. Of course, more work needs to be done, and there is a group investigating the relationship between hearing loss and well-being to define a conceptual model of well-being in those with hearing loss.⁴ Following a research priority consensus exercise, we recommend future research to focus on how our hearing sense relates to different aspects of well-being, and how hearing rehabilitation might foster well-being. Also, we should explore collaborations with other disciplines to address hearing loss as a part of whole-person care, rais-

ing awareness and spreading knowledge on comorbidities in different healthcare fields, and advocating for hearing treatments as part of interprofessional healthcare.

A close collaboration with general practitioners, especially, could foster preventative care, identifying and addressing hearing loss and its comorbidities earlier in time.⁸¹ Also, optimizing communication in healthcare settings⁸² and care homes⁸³ deserves much more attention, as optimal communication is invaluable for adequate history-taking, reducing the risk of misdiagnoses, fostering retention of information, supporting self-efficacy, and treatment adherence.

Finally, hearing care providers are uniquely positioned to raise awareness, and put hearing loss and hearing rehabilitation in a much broader context. Therefore, they can play a key role in changing the conversation from “needing a hearing aid because you do not hear well,” to a conversation about what hearing and hearing rehabilitation can truly mean for an individual in the broader context of healthy living. Through a family centered-care approach, discussing comorbidities, hearing technology, and communication strategies, hearing care providers and hearing rehabilitation can be pivotal in fostering communication, participation in physically or cognitively stimulating activities, and social functioning—thereby serving as a catalyst for well-being. ▀

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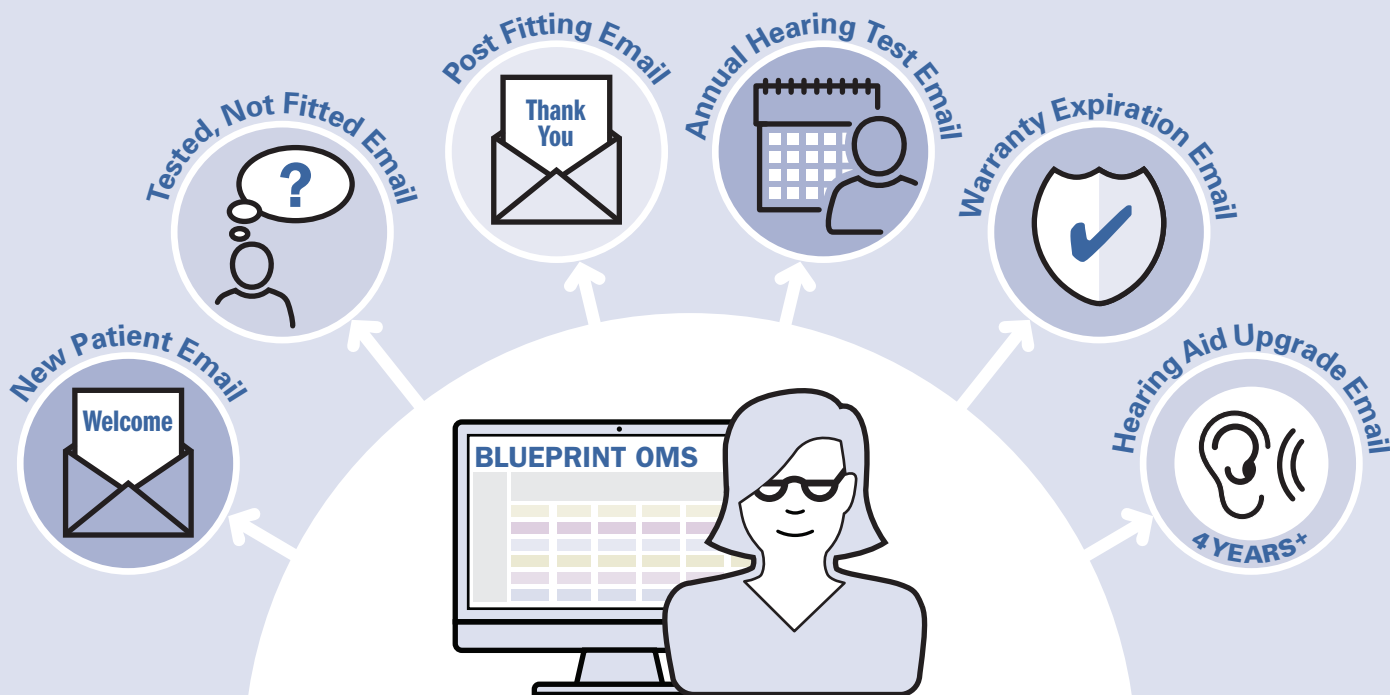
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Comparing Parent Perceptions to Datalogging Information in Pediatric Cochlear Implant Users

By CHRISANDA SANCHEZ, AuD, IVETTE CEJAS, PhD, and SMITA AGRAWAL, PhD

This study found that using datalogging as a tool for counseling parents about their child's use of and experience with the cochlear implant helps increase wear time, proactively identify technical issues for troubleshooting, and gain new insights into the child's listening environment and needs. This type of counseling not only provides an objective basis to encourage consistent device use, but also serves as a tool to motivate, reward, or validate parental support of their children's listening needs.

Today's cochlear implants (CIs) log data that provide insight into the recipient's everyday environment and use time. In the case of children, these factors can play an important role in speech and language development. The datalogging functionality can be used to objectively measure and counsel families regarding their child's device use.^{1,2} Since this feature is relatively new to CIs, little is known about its utility in pediatric CI users.

Previous literature has established that significant benefit is obtained from early cochlear implantation, including improvements in speech and language outcomes, read-

ing, and cognitive development in children.³⁻¹⁰ However, consistent device use is imperative to achieve and maintain these results.^{11,12}

In recent years, cochlear implant manufacturers have introduced datalogging that provides objective reports of hourly device use (measured as an average per day), time in different types of listening environments, and use of accessories. Datalogging can also identify when the headpiece magnet is not making a connection with the internal mag-

net. This may be due to the device falling off or being taken off the head, but can also be a reflection of an intermittency in the equipment. These events are identified as "unlocked" events in this study's datalogging report through the Advanced Bionics software. While several studies have documented that consistent CI use is observed in many children, averaging 9 hours/day,¹¹ few studies have compared these datalogging events to parental report.

The present study investigated the relationship between parent reports and the information obtained from the datalogging feature in Naida CI Q series sound processors.

Methods

A total of 8 children (4 females and 4 males) between 26 months and 65 months of age (ie, about 2-4.5 years) were enrolled at the Ear Institute at the University of Miami and participated in two study phases. All children had at least 6 months of experience with the AB Naida CI sound processor prior to study



Thank you for taking the time to answer the questions below. As you go through this survey, you will see spaces to provide answers for both right and left sound processors. Please answer the questions based on your child's sound processor configuration (left ear only, right ear only, both ears). If your child uses one cochlear implant (CI), you will be given the option to select "not applicable" when appropriate.

* 1. Ear(s) for which survey is being completed?

* 2. Estimating to the closest half hour, how long do you think your child used his/her sound processor today?

	hours	minutes
LEFT EAR	<input type="text"/>	<input type="text"/>
RIGHT EAR	<input type="text"/>	<input type="text"/>

* 3. Did your child spend a significant amount of time today with his/her sound processor off?

	processor off
LEFT EAR	<input type="text"/>
RIGHT EAR	<input type="text"/>

4. If you answered "yes" to question 3 for either ear, please explain (example: my child is getting used to a processor, equipment is broken or lost, my child was uncooperative, etc.):

Figure 1. A screenshot of the daily survey completed by parents over two weeks. The survey asked for parental report of their child's daily use of the CI sound processor and exposure to listening environments.



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recruitment. Seven were bilaterally implanted and one used the bimodal listening configuration (ie, cochlear implant with a hearing aid in the contralateral ear). Seven children were enrolled in weekly auditory verbal therapy and one in monthly auditory verbal therapy.

Parents completed a daily online survey during a 2 week period (Figure 1). The survey aimed to capture the parents' perspective of their child's CI usage, which included daily use duration, processor wearing configuration, program use, use of streaming devices, listening environment types (noise, quiet, music) and settings (eg, recreational, instructional, meal time with small or big groups, car, etc) and duration of exposure to these situations.

Additionally, families made multiple clinic visits over the study duration (5 visits over 6 weeks [Subjects 1 to 3]; 6 visits over 7 weeks [Subjects 4 to 8]). At each visit, the logged data were extracted from the Naida CI sound processors and compared to the weekly online survey data, as available. This information was used to counsel families on wear time optimization and listening environment experiences, and to determine if any changes in wear time and/or listening environments occurred following counseling sessions.

Results

Figure 2 shows the sound environment datalogging results from the 8 children. On average, the children spent a majority of their time in a "speech in quiet" setting (74.22%). These findings are aligned with parental observations as captured by the weekly online survey results (5.63 hours daily average). The findings are also consistent with the literature on adult hearing aid users assessing exposure in varying noise environments, which indicated adults were infrequently in noisy environments (ie, negative SNRs or close to 0 dB).¹³

Total daily use durations as assessed from datalogs and daily surveys were also found to be in agreement (9.56 hours and 9.04 hours respectively). These findings are in contrast with those from Walker et al,¹⁴ who found that 84% of parents overestimated their child's hearing aid use time. Figure 3 summarizes online survey and datalogging results regarding average daily use duration, and time spent in "speech in quiet" and "speech in noise" environments.

Figure 4 shows the average levels of sound

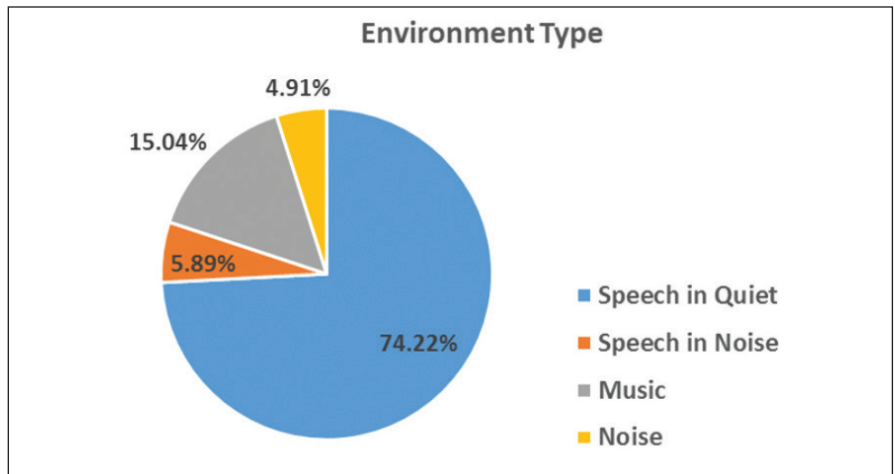


Figure 2. Data-logged proportion of time spent in four listening environments by the 8 children over the course of the study.

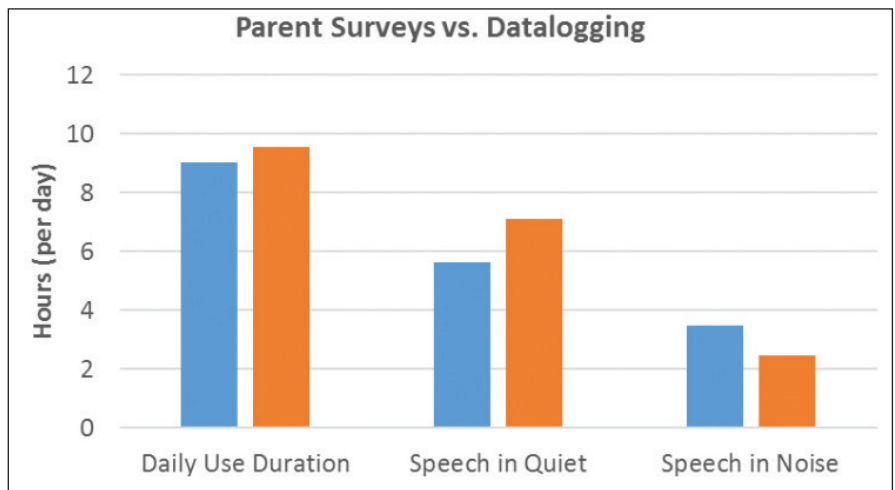


Figure 3. A comparison of parental observations (blue bars) and data-logged findings (orange bars) regarding daily device use duration, time spent in "speech in quiet" and "speech in noise" environments. Parental observations were in close agreement with the data-logged findings.

environments experienced by each child in a daily basis as measured by the BTE's datalogging. Children spent 39.15% of their BTE use time in sound levels <56 dB SPL. As a comparison, a datalogging study conducted by Banerjee¹⁵ in 10 adult hearing aid users found 50% time spent in environments ≤50 dB SPL.

Following counseling sessions, overall improvements were noted in daily usage and number of unlocked events. Duration of use appeared to increase in 4 of 8 subjects, and unlocked events decreased in 5 of 8 subjects. Battery type and slot usage features correlated with parental reports on the survey.

Clinical Implications and Conclusion

During this study, datalogging provided a series of clinically meaningful insights. Discussion with parents regarding use trends in the datalog likely contributed to

increased wear time. Additionally, logged streaming time was useful when counseling about the use of wireless accessories, such as the ComPilot or FM system. It was also a useful point of reference when encouraging patients to try new accessories.

For clinicians, access to datalogging information is a helpful tool for troubleshooting. For example, in our study one patient's logged data showed an abnormally high number of unlocked events (355), which prompted diagnosis of a cable intermittency that was previously unreported. To troubleshoot a high incidence of unlocked events, it is also important to consider non-hardware sources of occurrences. We find it helpful to ask families more detailed questions related to when the device is and is not being used, whether the unlocked events only happen in certain environments, and whether the

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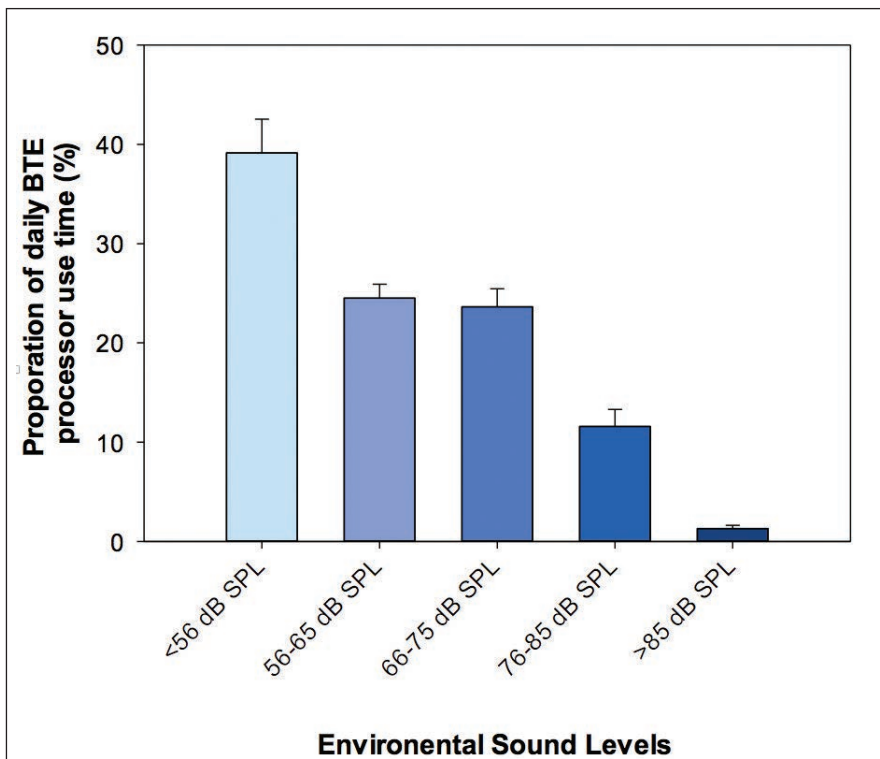


Figure 4. Average proportion of daily BTE device use as a function of environmental sound level. Error bars show standard error.

events are a reaction to when the child is upset or non-compliant. This will help determine whether programming needs to be adjusted or whether further counseling is needed to manage these behaviors.

Overall, families reported satisfaction in knowing that datalogging could identify intermittencies in equipment. Incorporating datalogging as a counseling tool by showing families percentages and overall wear-time appeared to be a motivating factor for families to continue their work in consistent use and device retention. Across all the data reviewed during these counseling sessions, families reported that they found the number of unlocked events and percentage of time in different listening environments to be the most helpful.

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The inclusion of a questionnaire to assess parent perception was a unique addition to the clinic visits. Over time, parents who participated in this study were observed to be more realistic with their estimates on device use. Parents were more inquisitive about their children's listening environments and this, in turn, made them more engaged and invested in committing to consistent use. The survey responses also highlighted the role of other significant individuals, such as grandparents, therapists, and teachers, and their involvement in the child's consistent CI use and the need for making them more aware and engaged.

We conclude that datalogging can be a valuable input to audiological counseling in cochlear implantation that positively influences daily device usage and, in turn,

positively impacts patient outcomes. This type of counseling not only provides an objective basis to encourage consistent device use, but also serves as a tool to either motivate, reward, or validate parental support of their children's listening needs.

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Moving Past the First Fit Approach and Modernizing the Hearing Healthcare Space

By DONALD HAYES, PhD

When Joe Sweet decided to pursue curling to improve his cardiovascular health, he did not expect to find out that he also suffered from hearing loss. He was unable to hear what the skip was saying, making it difficult to excel in the sport and socialize with his colleagues. The gradual hearing loss Joe experienced was compounded by the fact that every time he tried a hearing aid, it was either uncomfortable, too loud, or itchy. These hearing devices all ended up in Joe's bedside table, while outside he continued to suffer in silence.

Joe isn't alone. Approximately one-third of people in North America between the ages of 65 and 75—and one-half of those age 75 and older—suffer from some degree of hearing loss.¹ Perhaps even more alarming is the fact that 80% of those suffering from hearing loss are not wearing the proper aids and devices that could provide drastic improvements to their hearing experience.²

In the midst of an industry-wide transformation, a new first-fit strategy is needed to see higher adoption numbers of this critical adaptive technology.

Obstacles in Hearing Aid Acceptance

Hearing aids are evolving from medical devices to wearable consumer electronics, with technology advancing to include Bluetooth connectivity, TV and music streaming, and secure datalogging. These new offerings have expanded the prospective client base and made the hearing aid shopping experience more rewarding for those struggling to cope with hearing loss.

But hearing care professionals still face obstacles when it comes to fitting patients with these devices. While the primary goal of



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a hearing aid is to optimize a patient's hearing, the historic fitting process fails to take into consideration the innate tension between wanting to give a person the best speech intelligibility and the reality of what they are ready to hear.

Traditionally, when a patient is fitted for a hearing aid, the healthcare professional aims to create the most optimal fit. This maximizes speech intelligibility, providing enough amplification to hear both high- and low-frequency sounds right out of the box.

The problem they face is that hearing loss has a gradual onset occurring over many years. The longer a person has significant hearing loss, the more they have adapted to a diminished auditory world. It is hard for them to accept the sudden application of appropriate amplification because it is so much louder than how they remember everything being. When you are dealing with a patient who has never worn a hearing aid but suffers from hearing loss, the sudden jolt to their auditory system is alarming and can deter them from wearing a hearing aid in the future. This is how the devices end up on the nightstand.

Consequences of "Failed Fittings"

The consequences of an improper fitting experience can be devastating. Those experiencing a loss of hearing may be for-

ever deterred from properly addressing the issue. Poor hearing health can impact an individual's physical well-being as well as their socio-economic level. A recent study conducted by researchers at Johns Hopkins found that untreated hearing loss increases the risk of dementia by up to 50% compared to those without hearing loss.³ The study also found greater incidents of slips and falls, high blood pressure, and cardiovascular disease. Depression rates also increased by 40% in five years for adults suffering from hearing loss.

Hearing impairment also triggers structural changes in the brain. The average person loses their hearing over time, but there is enough redundancy within the brain to fill in the blanks when that person can no longer understand every word in a sentence. When a little hearing sensitivity is lost, we work just a bit harder to piece together what we do hear and fill in the blanks based on the context of the discussion. Each time our hearing sensitivity drops a little more, we will again work just a little harder to piece it together, but with slightly less information. Eventually, hearing loss reaches a point where the brain can no longer fill in the blanks, forcing people to exert a great deal of their energy and brain power on listening and impacting their well-being.

Unaddressed hearing loss can also pose significant socio-economic concerns. According to a study by the Better Hearing Institute,



Donald Hayes, PhD, is Director of Clinical Research at Unitron world headquarters in Kitchener, Ontario, Canada.

adults with hearing loss are more likely to be unemployed and, on average, earn approximately \$12,000 less annually than those without significant hearing loss.⁴ The estimated cost of lost earnings to the US economy is \$122 billion, which results in an estimated \$18 billion of unrealized federal taxes.

Rethinking the “First Fit” Approach

Audiologists and hearing aid specialists need to rethink the “first fit” approach to hearing aids. Adapting the “first fit” experience to be more reflective of a patient’s gradual hearing loss experience is an alternative that hearing care professionals should consider when fitting patients for new hearing devices. Pursuing a gradual transition allows the auditory system to receive, process, and accept sounds that have been missing for an amount of time.

The starting point begins with comfortable natural sound and enough amplification to provide benefit that is not jarring or overly loud. Over the next few days, as the wearer adjusts to the amplification, the devices slowly adjust upwards to the appropriate level that maximizes speech clarity. This gradual transition encourages the wearer to use the devices regularly without rejection due to over-amplification.

Factors that must be considered in this revamped “first fit” approach include calculating the average hearing loss in each ear, a person’s age, and the amount of experience with amplification to determine how much overall gain a patient should receive. Over the span of approximately one month, the hearing device should adapt to the patient’s changing auditory needs, eventually reflecting an industry standard fitting target for the greatest long-term benefit.

The industry is slowly moving towards this “first fit” approach, with companies like Unitron prioritizing a more gradual shift in hearing device capabilities using its Discover platform. But with the senior population in North America expected to double by 2036, it is paramount for healthcare providers to embrace new technologies that will improve hearing health and reduce the associated physical and socio-economic impacts.

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Calendar of Events

April 1-4: AAA 2020 + HearTECH Expo. New Orleans Ernest N. Morial Convention Center, New Orleans. <https://www.audiology.org>

April 19-22: XXXV World Congress of Audiology. Warsaw, Poland. <https://wca2020.com>

May 11-15: 179th Meeting of the Acoustical Society of America (AAS). Chicago Marriott Downtown Miracle Mile. <https://acousticalsociety.org>

May 20-23: 13th Annual Tinnitus Research Initiative (TRI) Conference 2020. Vancouver, Canada. <https://www.tinnitusresearch.net>

June 4-5: The British and Irish Hearing Instrument Manufacturers Association (BIHIMA) 2nd Annual Conference. Birmingham, UK. www.bihima.com

June 18-21: Hearing Loss Assoc of America (HLAA)

Annual Convention. New Orleans. <https://www.hearingloss.org>

July 16-17: 5th International Conference on Hyperacusis and the 2nd International Symposium on Misophonia and the Noise Sensitivity Symposium. Birkbeck College, University of London, England. <https://hyperacusisresearch.co.uk>

October 1-3: International Hearing Society (IHS) 69th Annual Convention. Town and Country Hotel, San Diego. <http://ihsconvention.org>

October 7-9: EUHA: 65th International Congress of Hearing Aid Acousticians. Hannover, Germany. <http://www.euha.org/events>

November 2-4: Academy of Doctors of Audiology (ADA) AuDacity 2020. Gaylord Texan Resort, Grapevine/Dallas Texas. <https://www.audiologist.org/conference>

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AAA 2020 + HearTECH Expo Preview



Note: All events and times subject to change. Please consult AAA Convention final program prior to finalizing plans. (\$ = paid events.)

Wednesday, April 1

- 8 am-5:30 pm **ARC: Auditory Neuropathy Spectrum Disorder** (\$). Lunch sponsored by Phonak.
- 8:30 am-12 pm Learning Labs (\$)
- 10 am-4 pm SAA Conference (\$) sponsored by Starkey.
- 12:30-3:30 pm **Symposium**. Presented by Starkey (see next page).
- 1-4:30 pm Featured Sessions, Grand Rounds, Learning Modules
- 4-5:30 pm SAA Mix and Mingle sponsored by Starkey.
- 4-7:30 pm HearTECH Expo** (see HearTECH Expo schedule)
- 5-7 pm Celebrate Audiology Reception in the HearTECH Expo**, sponsored by Hamilton CapTel.
- 7:30-9 pm AAA Foundation After Party (\$) sponsored by Phonak.

Thursday, April 2

- 8-9:45 am General Assembly**. Sponsored by Amplifon.
- 10 am-12:15 pm Featured Sessions, Mini Modules, Learning Modules
- 10 am-12 pm Over-the-Counter Hearing Aids and PSAPs
- 10 am-6 pm **HearTECH Expo** (see HearTECH Expo schedule)
- 12:30-2:20 pm Industry Updates
- 1-2 pm Poster Presentations
- 2:30-5:45 pm Featured Sessions, Grand Rounds, Learning Modules, and Research Podiums
- 6:30-8:30 pm **Symposium**. Presented by Phonak.
- 6:30-8:30 pm Symposia. Presented by ReSound.
- 7-8:30 pm Honors and Awards Banquet (\$). Sponsored by Phonak.
- 8:30-9:30 pm International Reception

Friday, April 3

- 7:30-11:45 am Featured Sessions, Grand Rounds, Research Podiums
- 7:45-9:45 am Hearing Aids in Review: 2019
- 10:15-11:45 am Marion Downs Lecture in Pediatric Audiology
- 9 am-3:00 pm HearTECH Expo** (see HearTECH Expo schedule)
- 12:30-2:20 pm Industry Updates
- 1:00-2 pm State Showcase
- 1-2 pm Poster Presentations
- 2:30-5:45 pm Featured Sessions, Learning Modules, and Research
- 3 pm HearTECH Expo Closes**
- 6-9:00 pm Event: Paddlewheeler Creole Dinner Cruise (\$)

Saturday, April 4

- 7-8:00 am Academy Membership Meeting**
- 8-11 am Clinical Education Forum: Meaningful Mentorship
- 8-11:30 am Featured Sessions, Grand Rounds, and Learning Modules by numerous Audiology organizations.

The American Academy of Audiology (AAA) will be hosting its AAA 2020 + HearTECH Expo in New Orleans on April 1-4. In last month's *Hearing Review*, we interviewed AAA 2020 Program Chair A.U. Bankaitis-Smith, AuD, about the new events taking place at this year's convention—particularly with regard to the all-new HearTECH Expo and the full schedule of events taking place there. Here's a preview of what to see at the Expo from the companies who bring this month's *HR* to you. ▶

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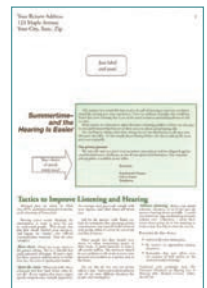


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Audiometers and Diagnostic Equipment

Interacoustics has recently announced the launch of AD528 in the US. The AD528 is an air, bone, and speech audiometer. Its quick startup is ideal for busy clinics, allowing for more patients to receive the treatment they require. The AD528 has a small footprint, low weight, and an optional carry bag, making it ideal for traveling clinicians who provide outreach to patients in need of hearing services. **Booth #935**. 1-800-947-6334; www.interacoustics.com



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AAA Symposium: “Welcome to Technology’s Leading Edge”

The Starkey Symposium & Reception, “Welcome to Technology’s Leading Edge,” will be held in Convention Center Room 352 on Wednesday, April 1, from 12:30-3:30 pm. There has never been a more exciting time to be in the hearing health industry. Hearing aids have evolved into multifunction devices that utilize artificial intelligence to deliver exceptional patient care. In this session, Starkey President Brandon Sawalich and Chief Audiology Officer Sara Burdak will provide a thought-provoking look at the industry and hearing healthcare technology. (952) 941-6401; www.starkey.com



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At AAA 2020, Widex will introduce the sound that changes everything—the revolutionary new WIDEX MOMENT™ hearing aid. Visit Widex at Booth 707 to hear for yourself. In the past, processing incoming sound took hearing aids five or more milliseconds—enough to introduce delay-based distortion that produces an unnatural “hearing aid” sound. WIDEX MOMENT™ builds on our legacy of innovation by eradicating delay-based distortion, streamlining the process of delivering a personalized fitting, and adding lithium-ion rechargeability to our hearing aids. **Booth #707.** (800) 221.0188; www.widexPRO.com

HearTECH Expo & Future Hub

AAA and the Hearing Industries Association (HIA) are proud to partner together and offer a new space in the expo hall where leading industry experts will gather and converse about the future of hearing healthcare. The **Future Hub** is an interactive lounge and learning space in the heart of the new HearTECH Expo. The Hub will be decked out with comfortable seating and a presentation stage at its core, and surrounded by technology kiosks and numerous areas for conversations.

Featuring learning with a mix of presentations from industry leaders as well as innovative education from experts outside of audiology, the Hub is your place to gain understanding and discuss the future of hearing health. Topics include:

- Mastering Communication
- Understanding Our Legislative Environment
- Elevating the Patient Experience
- Promoting Affordable Accessible Healthcare
- Growing Your Practice in an Online World
- Capturing Boomer Patients

- Finding Strategies for Balance and Resilience in a Time of Change

Featured Presentation: Thursday, April 2, 4-5 pm: *Navigating the Future Together: Gaining a Clear Vision of Goals*, moderated by Hearing Review Editor Karl Strom and featuring Brandon Sawalich, Starkey Hearing Technologies; Gary Rosenblum, Oticon; Eric Timm, WS Audiology; Tom Woods, ReSound; and Sandy Brandmeier, Sonova USA.

Research

'Chemical Earmuffs' Developed by Researchers Could Prevent Hearing Loss

Once you start to lose your hearing, you can't get it back. But what if you could prevent hearing loss by blocking, in advance, the effects of loud noises?

That's a route a team of biologists at the University of Iowa and Washington University, St Louis, say may be possible after the researchers identified a receptor that, when blocked, can prevent a common type of hearing loss. A summary of the research was published on the EurekAlert website.

Receptors are part of a suite of molecules on nerve cells in the ear that bridge the passage of sound and auditory information from inner-ear hair cells—the sound sensors—to the brain. The successful transmission of sound from hair cells to nerve cells, which occurs through a junction called a synapse, is integral to hearing in animals, including humans.

The researchers identified that some receptors involved in the hair-cell-to-nerve-cell transmission lack a protein called GluA2, and it is these receptors that are responsible for synaptopathy (hearing loss caused by irreparable damage to the synapses).

The biologists employed a drug in mice that selectively blocked the GluA2-lacking receptors, and prevented the mice from experiencing synaptopathy when exposed to noise.

The approach was like outfitting the mice with "chemical earmuffs" that prevented them from sustaining hearing damage by blocking the breakdown that occurs in some synapses between inner ear hair cells and



nerve cells when loud noises occur.

"It wasn't just putting earmuffs on—these earmuffs prevent the damage caused by loud sounds but don't muffle the sound," said Steven Green, professor in the Department of Biology and corresponding author on the study, published in the journal *Proceedings of the National Academy of Sciences (PNAS)*.

The experiments in mice indicate there is the potential to inject a drug that would prevent hearing damage in people before they're exposed to damaging noise. Conceivably, soldiers who are expected to encounter loud sounds in their duties could take a hearing-protection drug before exposure to those sounds, yet still hear commands. To be fair, this is more conjecture than fact, although the US Department of Defense (DOD) helped fund the research.

"Permanent hearing damage can be caused by noise levels that have been considered 'safe,' and people need to be careful about noise exposure because we can't yet repair synapses or regenerate hair cells," Green says. "Our chemical earmuffs are, currently, just an indication of the direction research can go,

not yet a proven, safe means of protection in humans."

In hearing, a chemical called glutamate is released from hair cells; this chemical transmits sound information at the synapse between inner-ear hair cells and nerve cells. However, loud sounds or even sustained moderate noise—such as sound coming through earbuds—cause the hair cells to release a glut of glutamate, effectively gumming the synaptic transmission of sound to brain neurons.

More specifically, it's the entry of calcium into the inner ear neurons through GluA2-lacking glutamate receptors that leads to synaptopathy. The researchers identified, at the molecular-level, receptors without GluA2, meaning those terminals that could cause hearing damage by allowing a flow of calcium. Even more, they then learned that if they blocked the receptors without GluA2, the GluA2-containing receptors picked up the slack, and hearing was maintained.

In the mouse experiments, they showed a drug called IEM-1460 could target—and block—the receptors without GluA2.

Green hopes to find other drugs that could prevent hearing damage and that could be administered non-invasively.

Along with the DOD, the National Institutes of Health (NIH), and the American Hearing Research Foundation (AHRF) funded the research. Ning Hu, associate research scientist in the Department of Biology at Iowa, is a co-author on the paper.

Learners of Foreign Language Find it Difficult to Recognize Own Errors, Research Says

Learners of foreign languages can hear the errors in pronunciation that fellow learners tend to make, but continue to fall foul of these errors themselves despite years of practice. A new study of Ludwig-Maximilians-Universitaet (LMU) in Munich shows that everyone believes their own pronunciation to be best, according to a press release published on the *Science Daily* website.

One of the most difficult aspects of learning a foreign lan-

guage has to do with pronunciation. Learners are typically prone to specific sets of errors, which differ depending on the learner's first language. For instance, Germans typically have trouble articulating the initial 'th' in English, as evidenced by the classical expression "Senk ju vor trävelling" familiar to passengers on German railways. Conversely, native speakers of English tend to have difficulty with the German 'ü', which they tend to pronounce as 'u'. Many people laugh at these

mistakes in pronunciation, even though they make the same mistakes themselves. But this reaction in itself points to a paradox: It demonstrates that learners register errors when made by others. Nevertheless, the majority of language learners finds it virtually impossible to eliminate these typical errors, even after years of practice.

This exaggerated assessment of one's own ability is an important factor that helps explain why it is so difficult to learn the

sounds of a foreign language.

In all cases, the listeners rated their own pronunciation as better than others did—even though they were unable to recognize that it was their own recording.

The results of the study underscore the importance of external feedback in language courses, because it increases the learners' awareness of deficits in language production and comprehension.

Researchers hope to develop apps providing feedback to users.

Researchers Find Two Biomarkers Involved in “Hidden Hearing Loss”

A pair of biomarkers of brain function—one that represents “listening effort,” and another that measures ability to process rapid changes in frequencies—may help to explain why a person with normal hearing may struggle to follow conversations in noisy environments, according to a new study led by Massachusetts Eye and Ear researchers and summarized on the hospital’s website. Published online in the scientific journal *eLife*, the study could inform the design of next-generation clinical testing for hidden hearing loss, a condition that cannot currently be measured using standard hearing exams.

“Between the increased use of personal listening devices or the simple fact that the world is a much noisier place than it used to be, patients are reporting as early as middle age that they are struggling to follow conversations in the workplace and in social settings, where other people are also speaking in the background,” said senior study author Daniel B. Polley, PhD, director of the Lauer Tinnitus Research Center at Mass. Eye and Ear and Associate Professor of Otolaryngology Head-Neck Surgery at Harvard Medical School. “Current clinical testing can’t pick up what’s going wrong with this very common problem.”

“Our study was driven by a desire to develop new types of tests,” added lead study author Aravindakshan Parthasarathy, PhD, an investigator in the Eaton-Peabody Laboratories at Mass. Eye and Ear. “Our work shows that measuring cognitive effort in addition to the initial stages of neural processing in the brain may explain how patients are able to separate one speaker from a crowd.”

In the *eLife* report, the study authors first reviewed more than 100,000 patient records over a 16-year period, finding that approximately 1 in 10 patients who visited the audiology clinic at Mass Eye and Ear presented with complaints of hearing difficulty, yet auditory testing revealed that they had normal audiograms.



Daniel B. Polley, PhD, and Aravindakshan Parthasarathy, PhD.

Motivated to develop objective biomarkers that might explain these “hidden” hearing complaints, the study authors developed two sets of tests. The first measured electrical EEG signals from the surface of the ear canal to capture how well the earliest stages of sound processing in the brain were encoding subtle, but rapid, fluctuations in sound waves. The second test

used specialized glasses to measure changes in pupil diameter as subjects focused their attention on one speaker while others babbled in the background. Previous research shows changes in pupil size can reflect the amount of cognitive effort expended on a task.

They then recruited 23 young or middle-aged subjects with clinically normal hearing with the biomarkers for hidden hearing loss to undergo the tests. As expected, their ability to follow a conversation with others talking in the background varied widely despite having a clean bill of hearing health.

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Information Please

Dr Jennifer Bobo Receives Scott Haug Outstanding Texas Audiologist Award

Widex announced that **Dr Jennifer Bobo**, a Key Account Manager for the Central Region, has recently been awarded the Scott Haug Outstanding Texas Audiologist Award for 2019.

This award is presented to a Texas audiologist who, directly in their service to individuals with hearing loss or in volunteer efforts related to the field of hearing health care, has made outstanding contributions to the audiology industry.

For the past 10 years, Bobo has planned and organized the Texas Academy of Audiology conference, organizing and leading educational seminars. She has also joined in legislatively to help fight for rights and technological advancements for individuals with hearing impairment, according to Widex's announcement.

Lastly, in addition to her "unparalleled service to patients," Bobo has mentored students to "pave the way for the next generation of outstanding Texas audiologists."

"Jennifer's focus is excellence—her willingness to go above and beyond is all she does. She is a doer; She gets involved. She encourages us to get involved too. It's in her DNA to lead. Most of us are better for it," said Kim Ringer, AuD, who presented Jennifer with the award.



Dr Jennifer Bobo

AuDlifestyle to Hold 'Hear to Move' 5K Walk/Run in April

The AuDLifestyle—a health-oriented group for audiologists based on SMART criteria goals (S-Specific, M-Measurable, A-Achievable, R-Relevant, T-Time Sensitive)—announced the second annual "Hear to Move" 5K Walk/Run, with all net proceeds going directly to support the Louisiana State University Student Academy of Audiology (SAA) and the Louisiana Tech Student Academy of Audiology (SAA) chapters.

The 5K will take place on the Friday of the AAA 2020 Convention, April 3, 2020, from 6:00-8:30 am, and will start at City Park in New Orleans, Louisiana.

Ticket prices range from \$15-\$30 and can be purchased on the event's website: <https://www.drgosalia.com/events-1/aud-lifestyle-5k-2020>. For additional information, please email: AuDLifestyle@gmail.com.



Eight-Year-Old Kenzi Cayton Wins MED-EL's 'Ideas4Ears' Competition

MED-EL USA announced that **Kenzi Cayton**, 8, from Vancouver, Wash, was named the US winner of the 2019-20 Ideas4Ears invention competition. A Grand Prize winner, Kenzi won a trip for two to MED-EL's international headquarters in Innsbruck, Austria, in June. The contest challenged children from around the world aged 6-12 years old to create an invention to improve the quality of life for people living with hearing loss.

"What Kenzi is the most excited about in winning the Ideas4Ears competition is meeting other kids with cochlear implants—it makes her feel at home," said Kelli Cayton, Kenzi's mother, who will accompany her to Austria in June with her father and older brother. "She is looking forward to getting to know children from around the world who have shared a similar experience, and getting to represent the USA."



During the trip to MED-EL's international headquarters, the winners will have the opportunity to meet other Grand Prize winners and young inventors from around the world, and will meet engineers and scientists behind MED-EL's many life-changing inventions.

Geoffrey Ball, inventor of the Vibrant Soundbridge, is the brains behind the contest and is also the head judge of Ideas4Ears. Ball lost his hearing as a toddler, but then, later in life, he went on to invent a middle-ear implant to treat his own hearing loss. He has the tough task (along with selected representatives from each country), to help choose the best ideas and brightest kids who will win the "trip of a lifetime" to Innsbruck.

Her winning entry was: "To create an implant that allows users to automatically and electronically change their skins to anything they want just by clicking a button in an app. The implant would be made of material that works like a screensaver on a phone or computer, so the design can be changed instantly with the push of a button. The app would have tons of different colors, styles, and designs so people with implants could easily change the look of their processors as often as they wanted."

■ Bose Closes 119 Retail Outlets

Following a trend in retail marketing, Bose announced the closure of all its retail stores in North America, Europe, Japan, and Australia—a total of 119 outlets. About 130 Bose stores remain open in Greater China and the United Arab Emirates, with additional stores in India, Southeast Asia, and South Korea.

Bose, headquartered in Framingham, Mass, reports that it opened its first store in the United States in 1993 to provide personal, private demonstrations for Wave music systems and Lifestyle home theater systems. As smartphones changed the industry, the company's focus turned to mobile, Bluetooth, and Wi-Fi solutions. Today, Bose noise-cancelling headphones, wireless sport earbuds, portable speakers, and smart speakers are increasingly purchased through e-commerce. The company sells its products primarily through its own website Bose.com, as well as on Amazon, Best Buy, Target, Apple stores, and third-party retailers.

“Originally, our retail stores gave people a way to experience, test, and talk to us about multi-component, CD and DVD-based home entertainment systems,” said Colette Burke, VP of Global Sales of Bose Corp in the company's press announcement. “At the time, it was a radical idea, but we focused on what our customers needed, and where they needed it—and we're doing the same thing now. It's still difficult, because the decision impacts some of our amazing store teams who make us proud every day. They take care of every person who walks through our doors—whether that's helping with a problem, giving expert advice, or just letting someone take a break and listen to great music. Over the years, they've set the standard for customer service. And everyone at Bose is grateful.”

The company says it will be offering out-placement assistance and severance to affected employees.

News of the its retail stores closing



comes on the heels of Bose's announcement in October that it would discontinue its Sleepbuds products. Sleepbuds were discontinued because “while the battery we chose functions safely, it doesn't work as consistently or predictably as it should to meet our standards,” according to Bose General Manager John Roselli in an email to Bose customers that was subsequently published in *Engadget*.

This string of news may have contributed to a rumor circulating within the hearing industry that Bose was closing its Health and Wellness division, which includes the Bose Hearing Aid, to concentrate on its core business and streamline revenues. A company spokesperson told *The Hearing Review* that “there is no accuracy to this information at all.”

■ GN Reports 15% Organic Growth in 2019

According to a press announcement from GN, the company's two divisions, GN Hearing (hearing aids) and GN Audio (headsets), delivered DKK 12.6 billion (US\$1.85 billion) revenue with organic growth of 15%.

GN Hearing continued to execute on the global rollout of the ReSound LiNX Quattro product family, including the launch of custom hearing aid variants, during 2019. The new portfolio includes “the world's first completely-in-canal (CIC) 2.4 GHz hearing aid with ear-to-ear connectivity and direct streaming to iOS and Android devices.” The performance during the year led to 7% organic revenue growth.

GN Audio continued to see impressive double-digit growth based on a “leading product portfolio and best-in-class commercial execution.” In the enterprise business targeting the Call Center & Office (CC&O) market, GN Audio achieved 26% organic revenue growth.

According to the company, GN continued to deliver “attractive shareholder returns enabled by solid cash flow generation during 2019.” It has distributed around DKK 1.4 billion to shareholders in 2019 via dividends and share buybacks.

The current one-year DKK 1 billion share buyback program will be concluded no later than March 10, 2020. As part of the current capital structure policy, GN plans to continue to buy back shares in order to continue to focus on creating shareholder value, subject to approvals by Annual General Meetings.

GN says it will, in the years ahead, drive growth by delivering uniquely individualized customer experiences and continue enabling people to “Hear More, Do More, and Be More.” Specifically, it will grow by offering increasingly individualized products and solutions. The group is now able to “significantly improve and personalize customers' hearing and listening experiences,” according to GN.



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Industry People

Decibel Therapeutics Makes Leadership Transition

Decibel Therapeutics, a development-stage biotechnology company, announced that **Laurence Reid, PhD**, has been appointed as Decibel's acting chief executive officer, bringing "deep experience in biotech company building." CEO Steven Holtzman is retiring and will become a strategic business advisor to the company.

As CEO, Dr Reid brings "deep experience in company building, strategy, and business development." He is an entrepreneur-in-residence at Third Rock Ventures and has held numerous leadership positions in the biotech industry. Most recently, he served as the CEO of Warp Drive Bio, a drug discovery company advancing novel oncology and anti-infective medicines, and where he ultimately negotiated the successful merger of the company with Revolution Medicines in 2018. In his previous role as chief business officer of Alnylam Pharmaceuticals, he led business development, finance, and legal functions.

Dr Reid is also a veteran of Millennium Pharmaceuticals, having served for

a decade in an array of management roles, including as general manager of Millennium UK, with responsibility for the company's European operations. He received his BA from the University of Cambridge and his PhD in biochemistry from the University of London.

"Hearing and balance disorders have an enormous impact on hundreds of millions of people worldwide, yet there are no medications to treat those disorders. That's astounding," Dr Reid said. "Decibel's deep understanding of the biology of the inner ear gives us a unique opportunity to develop life-changing therapeutics for these disorders. I believe that Decibel has built a superb research and drug discovery team, and I am excited to help that team exploit these opportunities in transformative ways."



Laurence Reid, PhD, Acting CEO, Decibel Therapeutics

Søren Westermann Named DTU's 2020 Honorary Alumnus

Søren Westermann has been named the Technical University of Denmark's (DTU) Honorary Alumnus for 2020 in recognition of his "unique support for hearing research at DTU," the school announced.

Westermann graduated from DTU with a Master of Science in Engineering in 1981. Following his years as a student, he was very involved in the Widex family business where, for a number of years, he was



Søren Westermann

Director of Research, IP and IT, and later, Vice Chairman of the Board, until Widex merged with Sivantos in 2019 and formed WS Audiology. Today, Westermann is a co-

owner of WS Audiology and chairman of the board of T&W Holding.

The award as honorary alumnus is given on the basis of a nomination from DTU Elektro. The department says it has "benefited greatly from a close collaboration with Søren Westermann."

Former DTU Electrical Engineering department head, Kristian Stubkjær characterizes Westermann as "a firm support with constructive and useful views on what to pay attention to and how to prepare—all presented in the quiet and constructive way that is so characteristic of the way in which Søren interacts."

Westermann was a member of the DTU Elektro Advisory Board until 2016. He was also among the initiators of the Centre for Applied Hearing Research (CAHR)—started in 2003—and was involved in the establishment of the Centre for Acoustic-Mechanical Micro Systems (Camm), which began in 2014.

Westermann is "very honored to receive the title" and has also been very happy with the long cooperation with DTU, "right from the 'Odin project' at the acoustics lab in the mid-1980s, to the start of CAHR with Torsten Dau, 8+ years on the DTU Elektro Advisory Board, and finally, the start-up of Camm."

Starkey Announces Appointments of Georgiou and Ruch

Starkey announced it has created two new strategic leadership roles. Effective immediately, **Dr Archelle Georgiou** is the company's new Chief Health Officer, and industry veteran **Heinz Ruch** will take on the role of Chief Business Development Officer.

Dr Georgiou is a nationally recognized physician, healthcare industry expert, reporter, and author. She earned her medical degree from the Johns Hopkins University School of Medicine and served as a senior executive and Chief Medical Officer of United Healthcare from 1995 to 2007. Since then, she has worked as a consultant for various clients and projects aimed at improving health and the healthcare system.

As the former President and CEO of Amplifon in the United States, Ruch will bring more than 20 years of experience,



Dr Archelle Georgiou, Chief Health Officer, Starkey Hearing Technologies and Heinz Ruch, Chief Business Development Officer, Starkey Hearing Technologies.

leadership, and knowledge to Starkey. In his new role, Ruch will lead existing corporate strategies aimed at growing and developing Starkey's global footprint and will also assume oversight of Starkey's US Networks, Audibel and NuEar, and its third-party business unit, American Hearing Benefits.

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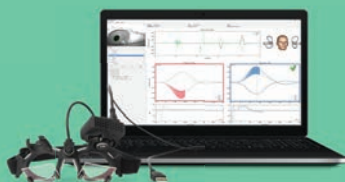
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