

# Starkey Press Release

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F O R I M M E D I A T E R E L E A S E

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***Audiology Online's*** Douglas Beck Interviews Brent Edwards, Ph.D., Executive Director, Starkey Hearing Research Center, Berkeley, California

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**BECK:** Good Morning Brent. Thanks for speaking with me this morning.

**EDWARDS:** Hi Doug. My pleasure.

**BECK:** Brent, for the folks not familiar with you, would you please tell me a little about your education and your professional history?

**EDWARDS:** Sure thing. I earned my Ph.D. at the University of Michigan in 1992. It was actually in electrical engineering, and I focused on applying signal processing to the auditory system. My primary interest, though, was in psychoacoustics, as it was more scientific while still mathematical, which led me to do my post-doc at the University of Minnesota in psychology, working on amplitude and frequency modulation perception.

**BECK:** And after that, you moved to California and got directly involved with the hearing aid industry?

**EDWARDS:** That's right. I was at GN ReSound from 1995 to 2000 as the head of research, working with signal processing, hearing science, as well as electroacoustics. After that, I went to Sound ID for a few years and then in 2004, I joined Starkey Laboratories to open the Starkey Hearing Research Center in Berkeley, California.

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**Starkey Marketing Services**  
9505 Hamilton Road • Eden Prairie, Minnesota 55344  
952.941.6401 • 800.328.8602 • FAX: 952.828.6985  
[www.starkey.com](http://www.starkey.com)



**BECK:** Brent, what is the mission of the Starkey Hearing Research Center?

**EDWARDS:** The mission is to apply basic hearing science in such ways as to develop technology that facilitates an improved quality of life for the hearing impaired.

**BECK:** Are we speaking essentially about better hearing aid circuitry, or is there a larger application here?

**EDWARDS:** Well, hearing aid circuitry and signal processing are a big part of it, but we also want to design better validation tests and better diagnostic tools to achieve better outcomes. While these tests are useful, speech reception thresholds and word recognition and discrimination lists are just not sufficient tools to measure the multitude of benefits available through digital hearing aids with advanced processing abilities.

**BECK:** So we need better outcome measurements?

**EDWARDS:** Right. Speech-in-noise tests, real-ear measures, and even well designed questionnaires can give us very useful information, but we also need better outcome measures, and better pre- and post-fitting analysis in general. Since one of the goals here at Research Center in Berkeley is to focus on long-term hearing research issues rather than directly focus on product development, investigating these outcome measurement issues form part of the research at the Starkey Hearing Research Center. In fact, we're working on individualized approaches to amplification, how the brain uses auditory and other cues to assess the auditory environment, and how that cognition changes when you place hearing aids on that individual. Stuart Gatehouse, a researcher I highly respect at the University of Glasgow, recently addressed the fact that access to environmental and other non-speech sounds is very important for hearing aid wearers, access that normal hearing people take this for granted. The hearing impaired, including those that wear amplification, live in a far more stressful world than those with normal hearing, in part because listening through impaired ears is more exhausting.

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**BECK:** I totally agree with all of those points, and it helps explain why pre- and post-fitting cognition measures may potentially have a major role to play in amplification analysis. On a related subject, can you please tell me about “informational masking?”

**EDWARDS:** Informational Masking has become a hot research topic recently among auditory scientists in the Acoustical Society of America, and it applies to particular aspects of hearing that involve cognition. Current research has investigated the role that spatial location plays in the understanding of speech in complex environments like the typical cocktail party, where listeners use the fact that different talkers are at different locations to focus attention on one speaker and ignore the others. One can think of this research as investigating how amplified speech and interfering sounds are represented in the brainstem or the temporal lobe rather than just in the cochlea.

**BECK:** So what should a basic post-fitting test battery include?

**EDWARDS:** Great question. Basically, it should reflect the benefits facilitated by the instrument within the patient’s living and working acoustic environments. In other words, it needs to reflect the reality that the patient experiences. By the way, I am not saying SRTs shouldn’t be used – SRTs should be used, but they are just one important piece of the post-fitting analysis. In fact, that’s true for speech audiometry in general. We certainly need speech audiometry results, but that’s just one piece of the puzzle.

**BECK:** So you’re saying we need better tools to diagnose hearing loss and better tools to measure the post-cognitive, dynamic outcomes of appropriate amplification?

**EDWARDS:** In a nutshell...that’s it.

**BECK:** Suppose I gave you ten patients with exactly the same audiogram, and I asked you to fit them with appropriate amplification...how would you go about that, and what might you expect?

**EDWARDS:** My first expectation, and this is something I know you've written and lectured about, Doug, is that I would expect ten different hearing aid fittings. This is the difficulty with "first fit" software and protocols...these software packages select a fitting protocol based on the general audiogram in isolation, maybe with an additional factor thrown in. But most clinicians know that hearing aid fittings are as much about fitting the brain as the ears, and each brain is different. That's why the "first fits" need adjustments and fine-tuning. So getting back to the question, I expect that I would have ten individuals and ten unique fittings. The hearing loss, the history, personal preferences, the audiogram, cognition, auditory processing, inner versus outer hair cells, the environment within which the hearing aids will be used, and other factors will directly relate to successfully fitting these ten people.

**BECK:** That's very interesting to me. I recall reading Harold Schuknechts' work from Harvard, from the 1950s and 1960s recognizing the importance in distinguishing pathology, and in particular sensory versus neural hearing loss...and in fact, we as hearing professionals, have pretty much collapsed that into "sensorineural" and by doing so, arguably we lose information.

**EDWARDS:** Yes, those are important distinctions, and his work was pivotal towards those theories. But that's the point...we need more information, not less, and to do a better job fitting hearing aids we need to embrace knowledge and technology. As a hearing aid company, we need to research and bench-test improved techniques and protocols to improve the outcomes across the board, from diagnostics, to fittings, to outcome measures. That's part of what the Starkey Hearing Research Center is focused on.

**BECK:** Thanks so much Brent. It's been a pleasure speaking with you.

**EDWARDS:** Thank you too, Doug. It's been fun for me, too.