

Press release

Study by Jace Wolfe shows: Phonak Roger technology and Advanced Bionics' ClearVoice allow CI recipients to hear better in noise

Evaluation of speech recognition of cochlear implant recipients using adaptive, digital remote microphone technology and a speech enhancement sound processing algorithm

Staeфа, Switzerland (May 19, 2015) - In a study published today in the Journal of the American Academy of Audiology*, a group of US American researchers describe how digital adaptive wireless microphone technology and a speech enhancement algorithm improve speech understanding in noise by cochlear implant recipients. The combination of the Phonak Roger wireless technology and the ClearVoice algorithm from Advanced Bionics however gave even better results, and allowed the participants to hear and understand speech in an environment in which they otherwise would have no opportunity to communicate.

Cochlear Implant (CI) recipients often experience difficulty with understanding speech in the presence of noise. Advanced Bionics developed the sound processing algorithm ClearVoice designed to improve speech recognition in noise, and research has shown this technology to be effective. The Roger remote microphone technology utilizing adaptive, digital wireless radio transmission has also been shown to provide significant improvement in speech recognition in noise**.

The research group led by Jace Wolfe, Ph.D. Director of Audiology at the Hearts for Hearing Foundation and Adjunct Assistant Professor in the Audiology Department at the University of Oklahoma Health Sciences Center and Salus University examined for the first time the potential improvement in speech recognition in noise when these two technologies are used simultaneously.

Speech recognition performance was measured with 11 Advanced Bionics CI recipients in background noise levels from 47 (fairly quiet) to 80 dBA (very loud). Performance was evaluated in four conditions:

- No ClearVoice and no Roger,
- ClearVoice enabled without the use of Roger,
- ClearVoice disabled with Roger enabled, and
- Simultaneous use of ClearVoice and Roger.

Use of ClearVoice and Roger each provided significant improvement in speech recognition in noise. The Roger system alone provided remarkable improvement in sentence recognition in noise from approximately 10% in quiet to 50% in challenging Signal to Noise Ratios (-5 to +5 dB SNR). The best performance in noise was obtained with the simultaneous use of ClearVoice and Roger.

The study findings indicate that although sound-processing algorithms and microphone directionality targeted at reducing noise are beneficial for cochlear implant users, they may not be sufficient to allow for satisfactory communication in many challenging real world settings. Consequently, implant recipients have the opportunity to take advantage of additional solutions like Roger technology for optimizing performance in noise.

"My previous studies with persons with cochlear implants have shown that use of Roger provides unmatched improvement in speech recognition in noise when compared to any other noise management technology available today. Considering that, I was pleasantly surprised when we found

The study at a glance

- *Test group:* 11 unilateral or bilateral Advanced Bionics CII/HiRes 90K cochlear implant recipients, 10 years or older (Mean age: 46 years)
- *Study design:*
 - repeated-measures single-subject design / participants served as their own controls
 - Subjects were fitted with four programs on the Naída CI Q70 processor with T-Mic2 and integrated Roger 17 receiver
 - For non-Roger test conditions, the audio mixing ratio was set to 100% T-Mic. For the Roger conditions, the audio mixing ratio was 50/50.
 - Subjects were tested in quiet and in noise with each of the four programs.
- **Major findings:**
 - **Use of ClearVoice and Roger each provided significant improvement in speech recognition in noise.**
 - **The best performance in noise was obtained with the simultaneous use of ClearVoice and Roger.**

that speech understanding in noise improved even further when Roger was used with ClearVoice,” comments Jace Wolfe.

The recommendation of the research team based on these study findings: Because ClearVoice does not degrade performance in quiet settings, clinicians should consider recommending ClearVoice for routine, full-time use for AB implant recipients. Roger should be used in all instances in which remote microphone technology may assist the user in understanding speech in the presence of noise.

What is Roger?

Roger by Phonak is the new digital standard that bridges the understanding gap in noise and over distance, surpassing the performance of standard FM systems by up to 54% and Dynamic FM technology by 35%.

It uses cutting-edge wireless microphones to pick up the voice of the speaker and transmit it wirelessly over 2.4 GHz to miniature ear-level receivers. Roger is hassle-free and adapts its own settings automatically to the noise and speakers around the use.

* Wolfe, Jace; Morais Duke, Mila; Schafer, Erin; Agrawal, Smita Koch, Dawn (2015), Evaluation of speech recognition of cochlear implant recipients using adaptive, digital remote microphone technology and a speech enhancement sound processing algorithm, *The American Journal of Audiology*, Volume 5, 2015.

** Professor Thibodeau, Linda, PhD (2014), Comparison of speech recognition with adaptive digital and FM wireless technology by listeners who use hearing aids, University of Texas, Dallas, USA, *The American Journal of Audiology*. Volume 23, 201-210, June 2014.

About Advanced Bionics

Advanced Bionics is a global leader in developing the most advanced cochlear implant systems in the world. Founded in 1993 and working with Phonak under the Sonova Group since 2009. AB develops cutting-edge cochlear implant technology that restores hearing to the deaf and allows recipients to hear their best.

With sales in over 50 countries and a proven track record for developing high-performing, state-of-the-art products, AB's talented group of technologists and professionals from all over the world are driven to succeed, work with integrity and stay firmly committed to quality.

To learn more about AB and its revolutionary cochlear implant technology, please visit www.advancedbionics.com.

About Phonak

Headquartered near Zurich, Switzerland, Phonak, a member of the Sonova Group, has developed, produced and globally distributed state-of-the-art hearing systems and wireless devices for more than 60 years. The combination of expertise in hearing technology, mastery in acoustics and strong cooperation with hearing care professionals allows Phonak to significantly improve people's hearing ability and speech understanding and therefore their quality of life.

Phonak offers a complete range of digital hearing instruments, along with complementary wireless communication systems. With a worldwide presence, Phonak drives innovation and sets new industry benchmarks regarding miniaturization and performance.

For more information, please visit www.phonakpro.com or contact:

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Phonak – Life is on

We are sensitive to the needs of everyone who depends on our knowledge, ideas and care. And by creatively challenging the limits of technology, we develop innovations that help people hear, understand and experience more of life's rich soundscapes.

Interact freely. Communicate with confidence. Live without limit. Life is on.