

## At University of Washington Speech & Hearing Clinic

# WE LOVE OUR PATIENTS!

To stay in touch, we've updated the look of our newsletter to provide you with the latest hearing healthcare news, clinic updates, and to extend special offers.

*Thank you for being our patient—we'll see you soon!*



# Welcome Fall!

## STUDENT CORNER

This May, University of Washington audiology students and clinical supervisors had the pleasure of participating in the Healthy Hearing booth at the Washington Special Olympics hosted by Joint Base Lewis-McCord. At the Healthy Athletes Healthy Hearing booth, we helped perform otoscopy, tympanometry, OAE tests and hearing screenings on athletes and their family members. This was a wonderful opportunity for our graduate students to practice clinical skills and gain more experience with people from a wide range of ages and populations.

Members of the UW Chapter of the Student Academy of Audiology host a variety of fundraising and social events throughout the year to help raise funds to cover the cost of transportation to the base and to purchase a small souvenir for the participants to take with them after having their hearing tested. This year, we were fortunate enough to receive a grant through the Student Academy of Audiology in addition to the funds we raised with our UW Audiology T-shirt campaign.

The audiology students and supervisors had so much fun participating in the Washington Special Olympics. The athletes and their families are a joy to work with every year, and *we look forward to volunteering again in 2016!*



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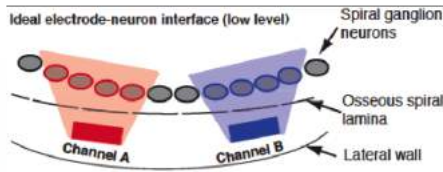
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# SOLVING THE MYSTERY OF THE **ELECTRODE-TO-NEURON** INTERFACE



I am Dr. Julie Bierer, a professor in the University of Washington's Department of Speech and Hearing Sciences, and my research focuses on cochlear implants. For over 10 years, I have been studying how to improve the listening experience of cochlear implant recipients by tailoring the programming of each device to the individual patient. Cochlear implants are surgically placed medical devices that electrically stimulate the auditory nerve for individuals who do not benefit from traditional hearing aids. Although cochlear implants are very successful at restoring some degree of hearing, listener performance is highly variable and unpredictable among individuals.



My passion for this research began when I became curious as to why individuals with similar hearing history were performing so differently. Some were at the top of the charts on speech recognition tests, while others were struggling to understand speech, even in quiet environments. So this became my challenge: to figure out the difference between these two groups of patients and determine

how to help those near the bottom of the charts. Many years of exploration have led me to conclude that the difference must lie in the electrode-to-neuron interface—the link between the physical cochlear implant electrodes and the target nerve cells. The figure above shows an ideal electrode-neuron interface, with channels A and B stimulating different populations of cells to convey unique information to the listener. My laboratory, the Bierer Lab, conducts studies to investigate how sound information is transmitted through this link and develops ways to improve the transmission. Assessing the electrode-neuron interface includes tests of pitch perception, speech understanding and other perceptual measures. Approaches to optimize the interface range from sharpening the electrical stimulation within the cochlea to activating only those electrodes that yield the best performance on specific listening tasks. The potential to improve an implant listener's understanding of speech and appreciation of music continues to be a rewarding experience for me, my graduate students and the research subjects who volunteer for our research.

Please visit the website for the Bierer Lab at <https://sites.google.com/site/biererlab/> to learn more, and sign up if you are interested in being involved in this exciting research.

Cochlear Implant



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## Wireless Technology

Hearing aids have become very sophisticated over the years, with features undreamt of just a generation ago. Nowhere is this more apparent than in the advent of wireless connectivity. Thanks to the proliferation of Bluetooth technology, today's hearing devices are more versatile than ever, and feature unparalleled sound quality and convenience.

Bluetooth is a wireless communications system that allows a variety of electronic devices, including computers, smartphones and personal audio players, to exchange data – in essence, communicating with one another.

Bluetooth enabled hearing aids come with a controller for transmitting and receiving wireless signals to and from other Bluetooth devices. By sending data through the wireless spectrum instead of over the airwaves, there is no need for the internal microphone to pick up and amplify sound. The result is clearer, more natural sound.

# DIABETES AND YOUR HEARING

The chances of developing type 2 diabetes during your lifetime are around 40% for Americans—nearly the same as getting cancer. According to the National Institutes of Health, 9.3% of Americans had diabetes in 2012. For those 60 or older, the percentage rises significantly to 26.9%. The portion of the population with diabetes has been creeping upward every year.

People with type 2 diabetes can suffer from a range of debilitating effects such as diabetic retinopathy, kidney disease, diabetic neuropathy, coronary artery disease, peripheral arterial disease and stroke. In addition, people with diabetes experience vestibular issues and hearing loss more often than people who do not have the disease. A study of 5,140 adults determined that hearing loss was much more common in people with diabetes and may very well be an independent risk factor for hearing loss.<sup>1</sup> A separate analysis of more than 20,000 participants indicated that people with diabetes are more than twice as likely to have hearing loss than those without diabetes.<sup>2</sup>

In addition, if you have been exposed to a lot of noise at your job or recreationally or have diabetic nephropathy, neuropathy or retinopathy, the opportunity for hearing loss increases.<sup>3</sup>

So what actually causes the hearing or balance problems associated with diabetes? A possible reason is that, over time, *elevated blood glucose levels (i.e. diabetes) may damage the nerves and blood vessels of the inner ear.*

**If you have diabetes, it is a good idea to have your hearing checked by an audiologist on a regular basis. Also, wear ear protection in situations where you may be exposed to loud sounds, and report any dizziness to your physician.**

1. Bainbridge, H.J., Hoffman, H.J., and Cowie, CC (2008): Diabetes and Hearing Impairment in the United States: Audiometric Evidence from the National Health and Nutrition Examination Surveys 1999 to 2004. *Annals of Internal Medicine*. Vol 149.
2. Taylor B, McKoy JM, Flow J, Watley SR. (2013) Diabetes and Hearing Loss - A Roundtable Discussion. *Audiology Practices* 5(3)
3. Wolfe AK, Honaker JA, Decker TN. (2011) Exploring the Association of Hearing Loss with Diabetes Mellitus—A Critical Review. *Seminars in Hearing* 32(4):332-342.



The hearing aid can connect with many different devices including television sets, cell phones, GPS systems and even other medical devices.

Wireless connectivity does come with a price: increased power demand. Most hearing aid batteries are tiny and unable to supply enough power for a steady Bluetooth connection. To get

around this, assistive listening devices called streamers have been developed. Usually worn around the neck, streamers provide a communication link between devices, picking up Bluetooth signals and transmitting them to and from hearing aids via an FM signal or electromagnetic field. In essence, the streamer works as a personal remote control for your hearing aids, enabling you to change the hearing program, raise or lower the volume, and mute the streaming sound – all with the push of a button.

← Oticon Streamer







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If you or loved ones participate in ***loud activities***,  
protect yourself from risks of hearing loss!

Noise induced hearing loss can be prevented with effective hearing protection! Preserving hearing is a key to allowing us to enjoy music and maintain effective communication for a lifetime.



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Schedule an appointment  
**and receive**

**10% Off**

when you purchase your  
custom ear protection!

\*Offer expires 11/30/2015