Editorial

Special Issue: Cochlear Implant Research from the University of Iowa

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Twenty-nine years ago we implanted a single-channel cochlear implant into a postlingually deafened adult. We were thrilled that the subject heard “sound” and received an improvement in speech reading. Who would have thought 30 years ago that patients with moderate-to-severe hearing loss would be receiving cochlear implants routinely, and be able to hear 70–90% of words spoken to them? At that time there was a reluctance to implant electrodes into the cochlea for at least two reasons. First, given the complexity of human hearing, the likelihood of cochlear implants enabling anyone to achieve usable hearing appeared slim. Second, there was great interest in hair cell regeneration, and it was argued that implanting the cochlea with an electrode might somehow preclude regeneration.

Today, cochlear implants are widely accepted as a routine procedure for severely hearing impaired children and adults. In many countries worldwide, bilateral cochlear implants are the standard of care.

Our cochlear implant program began as a fledgling group trying to identify subjects that might benefit from this new technology. This multidisciplinary group of auditory and speech scientists, electrophysiologists, and otologists wanted to understand how the devices worked and what we could do to improve performance. Our research team has continued to expand. We started with some skepticism and concerns. Were multichannel devices better than single-channel devices? Could young children without a language template learn to use the electrical stimulus encoded? We have cautiously expanded boundaries, making sure that our research justified change.

In this invited issue of the Journal of the American Academy of Audiology, we share a variety of our work in diverse areas, including the benefits of implanting a shortened electrode in patients who have substantial residual low-frequency hearing and acoustic speech perception in the implanted ear. The perception of music is related to other abilities, the time required to develop binaural hearing with implants is explored, and electrophysiological measures are applied to a wide variety of implant issues.

While there is no question that cochlear implants work, it is equally true that few patients with cochlear implants approach the full complement of abilities experienced by those with normal hearing. More work is needed to improve fitting to maximize individual performance, refine signal processing and tailor it to the individual, and develop selection and programming strategies for children under 1 yr of age. Furthermore, hybrid implants aimed at stimulating high-frequency regions while preserving low-frequency acoustic hearing have the potential to widely expand the benefits of electrical hearing with their ability to improve speech perception for a much larger population.

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Guest Editors

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