Improving Hearing Aids (HA)
Can self-adjustment of HA improve user outcomes?

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Hearing aid users compare self-adjusted versus audiologist-fit hearing aid settings using EarMachine software on an iPod. Listeners adjusted settings in simulated restaurant environment.

Results
In noise, 30 listeners with similar amounts of hearing loss chose highly variable gain. Gain differences were as large as 30 dB.

• When self-adjusting gain, listeners choose the audiologist’s gain for quiet situations
• In noisy environments, listeners vary greatly in the gain selected
• Only a few listeners sacrificed intelligibility of speech to achieve greater comfort
• Allowing self-adjusted gain shows promise for greater listener satisfaction in noise

Improving pitch perception in cochlear implants

Issue: Pitch is poorly represented in cochlear implants, leading to many perceptual deficits.
Question: Can we restore pitch via electrical stimulation of cochlear implants?

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Pitch is crucial for:
• Music perception
• Speech perception in noisy backgrounds
• Segregating sources
Yet we know little about how pitch is processed in the normal auditory system.

How is pitch perceived in normal hearing?
How is pitch affected by hearing loss?
How can we recreate it via electric hearing?

By separating temporal envelope from temporal fine structure cues, we were able to establish that pitch is coded primarily by the fine structure cues

New coding strategies are being tested to improve the representation of spectral and temporal fine structure in cochlear implants.

Issues
- Many individuals cannot benefit from a cochlear implant due to damaged auditory nerve.
- Question: Can stimulation within the auditory brainstem beyond the damaged auditory nerve provide sufficient hearing restoration?

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If deaf individuals will be implanted with a new two-shank electrode array into the auditory midbrain. This new brain hearing device is known as the Auditory Midbrain Implant (AMI).

Hearing performance, safety, and positioning of the device will be assessed in these individuals over a two-year period starting in early 2016.

The only FDA-approved brain hearing device is the auditory brainstem implant (ABI), which has achieved encouraging hearing results.

However, the ABI generally achieves limited speech perception, which has been linked to damage in the brainstem region caused by tumors and/or the tumor removal process in the main patient population.

The AMI may provide an approach that bypasses this damaged region and provide better hearing performance.

The clinical trial will begin early 2016.

Encouraging results in this clinical trial will open up opportunities for the AMI to serve as an alternative to the ABI and potentially provide a better implantable hearing device than currently available in the hearing field.