Benefit of Bilateral Hearing Technology for Understanding Speech over the Telephone

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The Problem

• Many cochlear implant recipients experience difficulty with understanding speech over the telephone
  – Without or even with traditional solutions
DuoPhone
(Advanced Bionics Naida CI Q70)

- Ipsilateral signal is streamed to the contralateral side
  - Signal is perceived **bilaterally**
- Contralateral microphone signal is **attenuated**
DuoPhone
(Advanced Bionics Naida CI Q70)

Wireless audio streaming

Phonak HiBAN Technology
Hearing Instrument Body Area Network:
Short-range audio streaming
via digital near-field magnetic induction (10.7 Mhz) and CODEC
Study Objective

To evaluate the effectiveness of bilateral input via DuoPhone on speech understanding over the telephone

– Bilateral CI listeners
– Word recognition
– Mobile phone
Methods: Subjects

• 10 Adult Bilateral CI Users
  – Age
    • Range: 43-70 years old
    • Mean: 58.7 years old (SD=8.7)
  – Advanced Bionics HiRes 90K and/or CII implants
  – Duration of Hearing Loss: 15.7 years
  – Duration of Severe-Profound Hearing Loss: 7.6 years
Methods: Equipment

• Advanced Bionics Naida CI Q70 sound processor programmed with participant’s program and:
  – ClearVoice (Medium)
  – Phone volume control set to participant’s MCL
Methods: Equipment

Target:
CNC words @MCL (50 words list)

Noise:
Uncorrelated Classroom Noise @ 65 dBA
Methods: Equipment

Ambient Noise Level: 44 dBA
Reverberation: .7 sec
Methods: Conditions

With T-Mic2

1. Monaural

2. DuoPhone

3. DuoPhone, Contralateral Mic Off
Methods: Conditions

With T-coil

4. Monaural

5. DuoPhone
Results
T-Mic2 – Monaural vs. DuoPhone

Significant improvement in Quiet & in Noise (RMANOVA)
T-Coil – Monaural vs. DuoPhone

Significant improvement in Quiet & in Noise (RMANOVA)
Monaural – T-Mic2 vs. T-Coil

Equivalent scores
T-mic sound quality preferred
T-Mic2: Underrated & Underappreciated
Conclusions

• Use of the DuoPhone resulted in better word recognition in quiet and in noise

• Subjects responded favorably to the sound quality of DuoPhone and also of the T-Mic2

• Use of the telecoil often resulted in complaints of buzzing/static noise and/or of awkwardness with phone orientation to the ear

• When using DuoPhone, better telephone performance may be achieved by disabling microphone(s) of contralateral sound processor
• Thank you for your attention!