Use of a Non-Preferred Ear: Can Outcomes Improve for Sequential Bilateral Cochlear Implant Users?

K. O'Reil, AuD, PhD & D. Brackett, PhD

Introduction

• Bilateral Cochlear Implants are now common in the clinic.

• At this time, most bilateral CI users acquired a 2nd CI from 1 to 15 years after receipt of the first implant.

• Sequentially implanted individuals present a unique challenge to audiologists as they attempt to program the devices and counsel the clients about outcomes.

• Anecdotal observations suggest that some individuals have a "preferred" ear (PE) and some choose to have limited use of "non-preferred" ear (NPE).

Survey Results

• More than 90% of individuals had an ear preference
• Preference was most often related to sound quality difference
• In some cases, wear time was lower for the non-preferred ear
• In some cases, ear preference was related to internal device

• Overall
  • 95% of people indicated that two ears is better
  • Do you like it?
Introduction: Subjective Reports of NPE

1. It's like hearing through a window.
2. It's like hearing through jelly vs. air.
3. My NPE helps fill in the gaps. I'm not confident with it, but this is probably because I'm too scared to listen with it alone.

Purpose

- The purpose was to determine if improved outcomes (subjective and objective) are achievable for individuals with a "non-preferred" cochlear implant ear.

Participants

- 5 Sequential Bilateral Cochlear Implant Users
  - Symmetrical Detection Levels < 40 dB HL
  - Mainstreamed/Hearing Work Environments

<table>
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<tr>
<th>Age</th>
<th>Implant</th>
<th>Age of I</th>
<th>Age of P</th>
<th>Ear Implant Age</th>
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<td>16</td>
<td>Bilateral N5s</td>
<td>15</td>
<td>10</td>
<td>18.5</td>
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<td>16</td>
<td>Bilateral Naida</td>
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<td>11</td>
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<td>16</td>
<td>Freedom &amp; N5s</td>
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<td>12</td>
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</tbody>
</table>

RESULTS: Participants 1 & 2

- Started with good perception
- Poor wear times
- Reduced confidence

Therapy Focus

- NPE Only
- Open Set
- Word & Sentence Level
Subjective Comments

1. “Practicing with only my left ear made it easier and made me more confident.”
2. “After practicing with only my left ear, I wear it more. I still don’t like it.”

RESULTS: Participant 3

- Started with good perception
- Intensive rehab following receipt of 2nd side
- Went to college & poor wear time
- Reduced confidence

- Therapy Focus
  - NPE Only
  - Speech Tracking
  - Focus on Confidence

RESULTS: Participant 4

- N22 internal in PE
- Large discrepancy between the two ears
- Very discouraged with second side

- Therapy
  - NPE Only
  - Limited Closed Set
  - Discrimination Tasks

RESULTS: Participant 5

- N22 Internal in PE
- Large Discrepancy between the two ears
- Feeling the NPE has plateaued

- Therapy
  - NPE Only
  - Topic Cued Speech Tracking

Subjective Reports

- Dad: “I’ve noticed a big change over the summer and communication is easier”
- Mom: “The quality of her voice has improved with both ears. Her speech is clearer and she doesn’t ask for as many repetitions in noisy situations.”
- Friend: “When she wears the NPE alone, she can recognize when sound is present, what the sound is, and my voice. I’m really proud of her hard work”

Additional Results: Participant 5
Introduction: BKB-SIN Results

Overall Results

- Speech perception changes were the slowest to occur and varied widely from subject to subject.
- Other changes:
  - Increased Wearing Time
  - Increased Confidence
  - Increased Functionality in Noise
  - Larger ranges between threshold and comfortable levels in the programming.

How do we support bilateral CI users with ear differences?

- Is knowing that benefit is happening enough?
- What matters most?
  - Speech perception scores?
  - Confidence?
  - Comfort?
  - Subjective impression by self?
  - Subjective impression by others?
- Will the effects of rehab be long lasting?
- Should we focus programming on sound quality?

A special thank you to our participants & to our team!

Jessica Hasbrouck, MS & Jennifer Cox, AuD

Thank you!