Reaching Potentials

Indications for and Perceived Benefit of Cochlear Implantation by Families and Young Children with Unilateral Hearing Loss/SSD

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The Shepherd Centre · Sydney · Australia
Author disclosure information

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Any hearing loss has impact

- Listening
- Language
- Communication
- Inclusion

Reaching potentials
Bilateral vs Unilateral Hearing Loss: Where are we?

Bilateral hearing loss
- Clear agreement on need for audiological and educational intervention
- Evidence that demonstrates impact when this is early

CURRENT ➔ Diagnosis: birth ➔ Aided: By 3mths ➔ Intervention: By 6mths

Unilateral hearing loss/SSD
- No agreement on need for audiological OR educational intervention
- Limited evidence that demonstrates impact

CURRENT ➔ Diagnosis: birth ➔ Aided: ? ➔ Intervention: ?

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Bilateral hearing loss

Diagnosis: birth
Aided: By 3mths
Intervention: By 6mths

Unilateral hearing loss/SSD

Diagnosis: birth
Aided: ?
Intervention: ?
Unilateral Hearing Loss (SSD) in Early Intervention

147 children in program diagnosed with UHL (of 535 in total)

Increase in families seeking early intervention for their children with UHL

5% progressed to bilateral
17% deteriorating
17% ongoing Middle Ear

> 1/3 seeking intervention over 12mths of age due to concerns

55% Sensorineural; 27% Conductive

42% with HL in CI candidacy levels
Unilateral Hearing Loss (SSD) & Outcomes

- **78%** have language outcomes on standardized testing within the typical range
- Despite concerns from parents, preschool/child care/school teachers about
  - Listening attention
  - Behaviour
  - Frustration
  - Effort
- All devices choices supported
- ↑ those asking and wanting CI as an option
- 37 surgeries CI+ UHL since 2011
  (age ranges: 8mths – 16.5yrs)
MRI results for children with UHL (SSD)

Children with CI
- Normal: 77%
- No MRI information found: 2%
- Fused nerve: 20%
- Thin nerve: 1%

Children with no CI
- Absent nerve: 47%
- Thin nerve: 32%
- Fused nerve: 15%
- No MRI information: 5%

23%
Listening Outcomes using the Functional Listening Index (FLI-P 1.1)

Children with Unilateral Hearing Loss including additional needs

- Bilateral Profound CIs under 6 months
- Unilateral No CI
- Unilateral with CI
Individual Trajectories (none with Additional needs)

Listening Outcomes using the Functional Listening Index (FLI-P 1.1)

n = 550
2,587 data points
Aim

Retrospectively review children and families who have chosen to receive cochlear implants with a UHL,

• perceived benefits by users and parents/carers
• drivers for decisions
• alignment of pre implant decision drivers with outcomes
• how benefit differs from measureable outcomes

To guide information, discussion with families & development of future tools to measure benefit
Methodology


- Distributed to all current clients
- Identifying information optional
- Response rate 65% (n=15)
- 13 from parents/carers; 2 from CI users
- Age range: 3 <6yrs, 4 6-12yrs, 8 >12yrs
- No additional needs in group, 2 with CMV
- 3/15 English as an additional language
- All have always had language results at age appropriate levels
- Only 4 indicated they wore a device prior to CI all or most waking hours
- 13/15 identified they wear their device all or most waking hours
Areas of change?

How would you classify the level change in the following areas after implant?

- Ability to understand every day conversations (n=15): 7% (93% significantly better)
- Understanding when someone speaks to me/my child from a distance (n=15): 13% (67% significantly better)
- Attention to what's being said in noisy situations (n=15): 13% (67% significantly better)
- Confidence in unfamiliar places with people I don't know (n=15): 13% (67% significantly better)
- Listening in noisy places like a shopping centre (n=15): 13% (67% significantly better)
- Attention to what's being said in quiet places (n=15): 20% (80% significantly better)
- Knowing where a sound is coming from (n=15): 27% (73% significantly better)
- Tiredness at the end of a typical day (n=15): 20% (73% significantly better)
- Willingness to participate in group situations (n=15): 27% (73% significantly better)
- Frustration in listening in noisy places (n=15): 20% (87% significantly better)
- Confidence in familiar places with people I know (n=15): 33% (67% significantly better)
Impact of consistent prior device use?

How would you classify the level change in the following areas after implant? No Device Prior

- Ability to understand everyday conversations: 91% Significantly Better, 5% Slightly Better, 4% No Change
- Attention to what’s being said in noisy situations: 52% Significantly Better, 29% Slightly Better, 19% No Change
- Confidence in unfamiliar places with people they don’t know: 52% Significantly Better, 29% Slightly Better, 19% No Change
- Understanding when someone speaks to them from a distance: 52% Significantly Better, 29% Slightly Better, 19% No Change
- Listening in noisy places like a shopping centre: 52% Significantly Better, 29% Slightly Better, 19% No Change
- Tiredness at the end of a typical day: 73% Significantly Better, 27% No Change
- Attention to what’s being said in quiet places: 73% Significantly Better, 27% No Change
- Willingness to participate in group situations: 73% Significantly Better, 27% Slightly Better
- Confidence in familiar places with people they know: 64% Significantly Better, 36% Slightly Better
- Knowing where a sound is coming from: 64% Slightly Better, 36% No Change
- Frustration in listening in noisy places: 65% Significantly Better, 35% No Change

How would you classify the level change in the following areas after implant? Prior Device to Cochlear Implant

- Attention to what’s being said in noisy situations: 100% Significantly Better
- Ability to understand everyday conversations: 100% Significantly Better
- Confidence in unfamiliar places with people they don’t know: 100% Significantly Better
- Frustration in listening in noisy places: 100% Slightly Better
- Understanding when someone speaks to them from a distance: 100% Slightly Better
- Listening in noisy places like a shopping centre: 100% Slightly Better
- Tiredness at the end of a typical day: 75% Slightly Better
- Attention to what’s being said in quiet places: 75% Slightly Better
- Willingness to participate in group situations: 75% Slightly Better
- Confidence in familiar places with people they know: 75% Slightly Better
- Knowing where a sound is coming from: 75% Slightly Better
Drivers of decisions

**How important** were the following factors for you when making a decision about a cochlear implant?

<table>
<thead>
<tr>
<th>Factor</th>
<th>Importance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Being able to hear with both ears</td>
<td>8</td>
</tr>
<tr>
<td>Optimising my child’s hearing</td>
<td>7</td>
</tr>
<tr>
<td>Ability to speak clearly</td>
<td>6</td>
</tr>
<tr>
<td>Listening to someone speaking to them from a distance</td>
<td>5</td>
</tr>
<tr>
<td>Knowing where sounds are coming from</td>
<td>4</td>
</tr>
<tr>
<td>Safety &amp; awareness</td>
<td>3</td>
</tr>
<tr>
<td>Increased confidence in difficult listening situations</td>
<td>2</td>
</tr>
<tr>
<td>Reduced anxiety/frustration with listening in general</td>
<td>1</td>
</tr>
<tr>
<td>Impact of surgery/medical device</td>
<td>0</td>
</tr>
<tr>
<td>Improving attention in conversations, discussions</td>
<td>0</td>
</tr>
<tr>
<td>Being able to follow directions</td>
<td>0</td>
</tr>
<tr>
<td>Being able to understand what is said in a group situation</td>
<td>0</td>
</tr>
</tbody>
</table>

Impact since CI

Rate the following statements for the **level of impact** they have had since receiving a cochlear implant?

<table>
<thead>
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</tr>
<tr>
<td>The Shepherd Centre</td>
<td></td>
</tr>
</tbody>
</table>
Drivers in decisions; Impact since CI

- Ability to speak clearly
- Being able to follow directions
- Listening to someone speaking to me/them from a distance
- Increased confidence in difficult listening situations
- Safety and awareness
- Being able to understand what is said in a group situation
- Reduced anxiety/frustration with listening
- Improving/Improved attention in conversations, discussions
- Knowing where sounds are coming from
- Being able to hear with both ears

Drivers in decisions: Impact since CI.
How do you feel about the decision?

- 100% glad they did it OR wish they did it sooner

Time to benefit?

- 2/3rds within 6mths
What was the hardest thing?

The assumption by others that she is now 'fixed' and that the cochlear makes her hearing perfect (i.e./ normal level).

Digesting all the information received and input from other friends or relatives that having a device on doesn't "look" good.

Adjusting mentally. It took some time adjusting to new sounds and voices, discovering how much I had missed out on in terms of sound.

Adjusting towards having an implant hovering by my ear as well as the long process it is taking for my brain to actively respond to the implant.

Getting used to discussing to people (teachers, year mentors, strangers) about my hearing loss and what they can do to help me) was challenging as I never engaged people with my impairment.

It was hard and a real commitment to persevere for the long term (1-2 years) not knowing how successful it would be.... doing all the habilitation etc.

Deciding whether to proceed with the surgery and the angst of surgery.
The most surprising thing?

Her ability to participate in a group and also it has been very obvious that if she doesn't wear her device she is less confident.

How much my tolerance for discussions has improved in terms of noise levels, I don't get tired as much when wearing the CI compared to pre-CI.

How quickly he responds when talking on the profound side, we did not experience this prior to CI.

How easily I can interpret people in conversations, noisy and quiet. I no longer feel as if I have to struggle as much to make an effort.

Her confidence has grown enormously as far as explaining her implant to new curious friends.

Her confidence levels have skyrocketed - I thought she was a 'shy' kid, however since getting the CI her personality has blossomed.

Being able to hear bird calls and the difference in the up and down bow on her violin.

We are so blessed that it has been a success and she is committed to wearing it because it does have a significant positive impact on her hearing.
What you would say to others considering the decision?

If hearing goes in the good ear later in life you have the other ear which has already learnt speech and can hear.

The evidence clearly shows the major advantages for people who have maximum hearing capacity in both ears. It has been well worth my child having a cochlear implant and I would highly encourage parents to strongly consider it for their child.

Don't wait any longer. Just do it!

Whilst we have nothing but good things to say about the implant, it's an individual choice at the end of the day. Get as much information as you can from as far and wide as you can (ENTs, cochlear recipients, health professionals) so you feel you are making an informed decision.

It's worth the effort and time.

I have seen remarkable change in every aspect of my daughter's life and have no hesitation in recommending an implant for a child with unilateral hearing loss. It continues to benefit each and every day.

It has changed our child’s life for the better.

So many people say ‘oh they have one good ear they will be fine and live a normal life’, yes they will live a normal life BUT they are missing out on experiencing hearing to the full potential, and with this potentially withdrawing themselves from conversations and social events.

It has truly taken a village of very committed professionals.

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Clinician feedback in differences pre and post CI

• Increased self-awareness, more aware of the thoughts and ideas of those around them
• Decreased rigidity and inflexibility (transitions, change in tasks)
• Increased confidence in themselves and ‘having a go’
• Attachment to their new device
• Obvious behavioural changes when it was time for a MAP
• Positive feedback very early on after implantation - no seed of doubt it was the right decision
• Unique challenges of establishing compliance in wearing the device.
• Different from bilateral HL / CI mainly in therapy
• Clear and informed choice was driving factor for parents
And therefore as a stranger give it welcome. There are more things in heaven and earth, Horatio, Than are dreamt of in your philosophy.

(Hamlet)
References

Hornsby, B. W. Y. (2013). The effects of hearing aid use on listening effort and mental fatigue associated with sustained speech processing demands. Ear and Hearing


Cochlear Limited (2015) Children Using Hearing Implants Quality of Life Questionnaire

