Considerations for Combining Hearing Aids and Cochlear Implants

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- About 1/3 wear hearing aids on the contralateral ear.
- Diverse feedback from the children.
Combining Cochlear Implants and Hearing Aids

- Cochlear Implant technology has improved significantly.
Combining Cochlear Implants and Hearing Aids

- More advanced hearing aids.
- Patients with greater residual hearing are implanted.
- Reports of significant patient benefit.
CI candidacy criteria

- CI candidacy criteria has widened.
- More children and adults with cochlear implants have sufficient useable hearing in the contralateral ear.
How do the implanted children hear?

- Audiogram in free field on 6 Cochlear Implant children, tested with the programming they use every day.
What ear do we choose??

- The better or the worse hearing ear?
- Different clinical praxis.
- At our clinic we preferably choose the worse hearing ear.
Changing traditions in Denmark

- Educational settings and hearing aids.
- Strong deaf community in Denmark.
Bimodal Stimulation
What is Bimodal Stimulation?

- Supplementing electrical stimulation (cochlear implant) with acoustic stimulation (hearing aid) provided to the contralateral ear.
Benefits of Bimodal Stimulation

- Similar to the benefits of bilateral hearing aid fitting.
- Improvements in:
  - Speech perception (especially in noise)
  - Localization
  - Ease of listening
Candidacy Issues

- Bimodal stimulation prevents the atrophy of speech recognition.
- Bilateral implantation later in life.
Likely hearing thresholds in the contralateral ear
Do hearing aids interfere with cochlear implant performance?

- Does the hearing aid (acoustical) input interfere with the cochlear implant (electrical) input?

- Published research studies conclude that there is no interference (Ching, 2001).
Do hearing aids interfere with cochlear implant performance?

- Many of our Cochlear Implant children are very happy wearing their hearing aids on the contralateral ear.

- These children have often worn hearing aid since they were very young and are used to the sound.
Do hearing aids interfere with cochlear implant performance?

- Clinical experiences also show cases of decrease in speech recognition after hearing aid fitting on the contralateral ear.

- Masking effects from the hearing aid to the cochlear implant?
Do hearing aids interfere with cochlear implant performance?

- Downward spread of masking and stimulation on dead zones?
- How long should we wait before seeing improvements in speech recognition?
- Adjustments are needed before getting full benefit of the bimodal stimulation.
Do hearing aids interfere with cochlear implant performance?

- Sometimes it has just been too long?
- Research (Ching) shows that by gradually reintroducing a hearing aid most children will adapt to the hearing aid again.
Fitting Tip

Use a hearing aid that has a volume control so the patient can adjust the volume for the situation.
Feedback Management and Cancellation

- Manipulate the audiogram by putting the thresholds of the high frequencies in the normal hearing range to avoid any feedback.
Manipulated audiogram
Bimodal stimulation

- At the moment we don’t have any objective results of our own on bimodal stimulation, but research agrees on the benefits.
Bimodal stimulation

- We encourage all our Cochlear Implant patients to wear a hearing aid on the contralateral ear.

- Counseling and management programs include the use of a hearing aid in the non-implanted ear.
Summary of presentation

- It takes time to gain the full benefit from contralateral stimulation.
- For some it might even have been too long.
- The longer the lack of stimulation the more difficult it seems to adapt to the hearing aid.
- Nonlinear hearing aids with volume control are recommended.
Summary of presentation

- It is no longer an either/or between cochlear implants and hearing aids.

- Cochlear implant and hearing aid technologies combine to provide significant advantages especially in speech understanding in noise and localisation skills.
Thank you for your attention!