If you are viewing this course as a recorded course after the live webinar, you can use the scroll bar at the bottom of the player window to pause and navigate the course.

This handout is for reference only. Non-essential images have been removed for your convenience. Any links included in the handout are current at the time of the live webinar, but are subject to change and may not be current at a later date.
Technical issues with the Recording?

- Clear browser cache using these instructions
- Switch to another browser
- Use a hardwired Internet connection
- Restart your computer/device

Still having issues?

- Call 800-753-2160 (M-F, 8 AM-8 PM ET)
- Email customerservice@AudiologyOnline.com
Best Practices on CI Candidacy: Adults, in partnership with ACI Alliance

Sandra Prentiss, PhD
University of Miami

Donna Sorkin, MA
American Cochlear Implant Alliance

Disclosures

- Dr. Prentiss is a grant recipient through Med-El Corporation and a consultant for Sirocco Therapeutics
Learning Outcomes

After this course, participants will be able to:

- Identify current cochlear implant candidacy criteria.
- Describe the differences in CI candidacy testing and its impact on CI access.
- List guidelines for adult CI candidacy testing.

Why another organization in hearing health?

- Membership organization focused on cochlear implantation and access to care
- Members are audiologists, physicians, speech pathologists, educators and others on CI teams + consumers/parents, advocates
- Website designed for those in and out of CI
- Highly collaborative with other organizations
- Welcome your involvement!

www.acialliance.org
https://www.facebook.com/ACIALLIANCE.ORG/
Twitter@acialias
American Cochlear Implant Alliance

- Mission: Advance access to the gift of hearing provided by cochlear implantation through research, advocacy and awareness
- Address factors contributing to underutilization of cochlear implants
- Improve awareness regarding candidacy and outcomes
- Objective today: Share information to help patients who may benefit from CI move forward

ACI Alliance Motivation for Developing Best Practice Guidance

- Frequently we are asked by CI clinicians: “What is best practice? What are others doing?”
- CI Centers ask for documentation from ACI Alliance to help with gaining insurance approvals
- FDA guidelines are somewhat vague and don’t represent what clinics are doing
- Variability in how different CI centers approach candidacy determination
- Consumers learn of candidacy determinations that differ from what they have been told and then ask “Should I go elsewhere?”
- Hearing aid dispensers/audiologists are confused and/or using old methodologies
- Primary care physicians looking for guidance that will help them advise patients
What happens next?

- Suggested guidelines will be reviewed and discussed
- We will seek member input
- The Board of Directors will then adopt and publish best practices for adults and for children (likely two separate documents)

Utilization of CI in the U.S.

- ~38 million with HL
- Potential implant candidates: 1.2 million severe to profound
- ~100k received CI
- ~8.3% penetrated

Data Sources
2 Ida Research 2010 Report US Market for Hearing Aids and Audiology
3 Devices in 2009 there were approximately 1.2M patients who could benefit from a CI
4 96K (58k adults and 38k children) have received CIs in the U.S, as of Dec 2012. NIDCD website:
Reasons for Low Utilization?

- Low awareness in general population
- Referrals are not typically made by primary care physicians nor even by hearing aid audiologists
  - Unfamiliar with candidacy criteria
  - Physician is the #1 influencer on HHC decisions* Kochkin et al, 2012
- Deaf culture perspectives insert controversy and misunderstanding
- Insurance coverage issues though this is no longer a major concern for traditional CI

Candidacy Criteria
### Cochlear Implant Guidelines

#### Candidacy Criteria

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>AGE of implantation</strong></td>
<td>Adults 18 yrs +</td>
<td>Adults &amp; Children 2 yrs +</td>
<td>Adults &amp; Children 18 mos +</td>
<td>Adults only for Hybrid</td>
<td></td>
</tr>
<tr>
<td><strong>ONSET of hearing loss</strong></td>
<td>Post linguistic</td>
<td>Post linguistic adults/ Pre &amp; Post Linguistic Children</td>
<td>Adults &amp; Children Pre &amp; Post Linguistic</td>
<td>Adults &amp; Children Pre- and Post-Linguistic</td>
<td></td>
</tr>
<tr>
<td><strong>DEGREE of hearing loss</strong></td>
<td>Profound</td>
<td>Profound</td>
<td>S/P Adults Profound Children</td>
<td>S/P Patients 2 yrs + Prof Child&lt;2 yrs</td>
<td>Residual hearing: Normal to Moderate in low freq; Sev-Prof mid to high frequencies</td>
</tr>
<tr>
<td><strong>SPEECH SCORES</strong></td>
<td>0%</td>
<td>0%</td>
<td>40% or less</td>
<td>Speech perception score 50% or less in ear to be implanted, ≤ 60% in best aided condition</td>
<td>CNC word score &gt;10% but less than 60% in ear to be implanted; &lt;80% CNC words in contralateral ear</td>
</tr>
</tbody>
</table>

---

**FREQUENCY IN Hertz**

**HEARING LEVEL IN DECIBELS (dB)**

---
Medicare Guidelines

Medicare has traditionally been more restrictive

“The evidence is adequate to conclude that cochlear implantation is reasonable and necessary for treatment of bilateral pre- or post-linguistic, sensorineural, moderate-to-profound hearing loss in individuals who demonstrate limited benefit from amplification. Limited benefit from amplification is defined by test scores of ≤ 40% correct in the best-aided listening condition on tape recorded tests of open-set sentence cognition.”


How is candidacy determined?

- CIs have been an effective treatment for several years
- No national consensus on CI candidacy guidelines currently exist
- Administration of these tests are left to the discretion of the provider and open for interpretation
  - “best-aided”, quiet vs noise
Why do we need standardization?

- Consistent access
- Promote confidence in the patient
- Provide similar, HIGH QUALITY, level of care
- All practices should be evidence-based

Test material

- Minimum Speech Test Battery (MSTB)
  - CNC
  - AzBIO
  - BKB-SIN

- Elusiveness on testing approach may lead to inconsistent access to recipients
What are clinicians doing to determine CI candidacy?

- Survey was distributed via email blast to members of the American Cochlear Implant Alliance
- Respondents were audiologists currently involved in adult cochlear implant evaluations
- 99 responses (92 analyzed)

Clinic Profile

- Clinical Setting
- Number of implants per year
- Levels of Education
- Year in Practice

- Non-auditory factors
  - Psychological Testing
  - Cognitive Screenings
    - IQR of Factor Importance
- Pre-implantation Verification Measures
  - Speech Tests used for evaluations
  - Testing Levels
  - Testing in Noise
  - SNR Ratios Parameters

- Determination of Candidacy
  - Expanded Indications
  - Bilateral Indications
  - Medicare Indications

---

### Medicare Indications

<table>
<thead>
<tr>
<th></th>
<th>Audiologist Survey</th>
<th>Surgeon Survey*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Testing in noise conditionally</td>
<td>71%</td>
<td>28%</td>
</tr>
<tr>
<td>Always test in noise</td>
<td>29%</td>
<td>68%</td>
</tr>
<tr>
<td>Bilateral Consideration</td>
<td>56%</td>
<td>81%</td>
</tr>
<tr>
<td>Best-aided (CI+HA)</td>
<td>37%</td>
<td>28%</td>
</tr>
<tr>
<td>Best-aided (non-implant ear alone)</td>
<td>44%</td>
<td>53%</td>
</tr>
</tbody>
</table>

Discussion

- More than half of the referrals for cochlear implant evaluations are not wearing appropriately fit hearing aids
  - Kochkin et al, 2011
    - Only 36% of clinics use both verification and validation in the fitting process.
    - Successful patients with fit in 2 visits or less
    - Unsuccessful users required 4 – 6 visits

Discussion

- Most clinics value the importance of cognition; however, few are performing cognitive assessments or employing screening tools.
- Hearing loss negatively impacts cognition
  - Taljaard et al, 2015
- Treated hearing loss improves cognition
  - Taljaard et al, 2015
- Cochlear implants improve cognition, quality of life and autonomy
  - Sonnet et al, 2017
Discussion

- Speech perception in noise primary complaint of individuals with hearing loss
- Noise measures reflect real-world listening performance
- Evidence based in HA models suggest use of speech in noise measures for pre-fitting and HA verification
  
  - Word/speech recognition in quiet ability is not a valid indicator for real-world outcome (Cox, 2003; Carhart & Tillman, 1970)
- Only 40% of audiologists use pre-fitting speech in noise measures

Discussion

- Serviceable hearing by use of a hearing aid is defined by >40% by American Academy of Otolaryngology (AAO-HNSF, 1995)
- Similar to Medicare
- Are these guidelines up to date?
Conclusions

- Despite guidelines put forth by the FDA and experts in the fields, the ambiguity surrounding these guidelines has led to wide variability in practice methods.
- Careful considerations must be taken when making surgical decisions to maximize risk-benefit.
- The lack of standardization may play a role in outcome measures and how the clinician will interpret outcomes.
- These discrepancies in testing patterns may result in healthcare inequities.

Thank you!

S. Prentiss@med.miami.edu
Come back and see us in 2019!

CI2019 16th Symposium on Cochlear Implants in Children
7th International Conference on Bone Conduction and Related Technologies

www.OSSEO2019.COM
## References

- Sonnen et al (2017). Cognitive Abilities and Quality of Life After Cochlear Implantation in the Elderly. Otolaryngology, 38; e905-e911