New Developments in Hearing Aids and Assessment

UCSF Otolaryngology Update – 2009

Robert W. Sweetow, Ph.D.
University of California, San Francisco

US Hearing Aid Sales by Style

<table>
<thead>
<tr>
<th>Year</th>
<th>CIC</th>
<th>Other Custom</th>
<th>BTE</th>
</tr>
</thead>
<tbody>
<tr>
<td>2001</td>
<td>70</td>
<td>20</td>
<td>10</td>
</tr>
<tr>
<td>2002</td>
<td>65</td>
<td>25</td>
<td>10</td>
</tr>
<tr>
<td>2003</td>
<td>60</td>
<td>30</td>
<td>10</td>
</tr>
<tr>
<td>2004</td>
<td>55</td>
<td>35</td>
<td>10</td>
</tr>
<tr>
<td>2005</td>
<td>50</td>
<td>40</td>
<td>10</td>
</tr>
<tr>
<td>2006</td>
<td>45</td>
<td>45</td>
<td>10</td>
</tr>
<tr>
<td>2007</td>
<td>40</td>
<td>50</td>
<td>10</td>
</tr>
<tr>
<td>2008</td>
<td>35</td>
<td>55</td>
<td>10</td>
</tr>
</tbody>
</table>
Advantages of open fittings

- Dual microphones
- Cosmetics
- Instant fit
- No occlusion
- Overall comfort
- Immediate repairs
- Better localization

Receiver In The Ear technology

Handsome man wearing an open fit hearing aid
Look at the pictures of the hearing aids. Please place an X on the picture or pictures of the style you would **NOT** be willing to use. Your audiologist will discuss with you if your choices are appropriate for you -

— given your hearing loss and physical shape of your ear.

Disposable hearing aid update

Songbird

Songbird
InSound Lyric

- Disposable
- “Instant” fit
- Mild to moderate loss
- Physically fits ~50% of ears
- Extended wear (up to 4 months)
- Placed by audiologist or physician
- Sold on an annual subscription basis

Poor candidates for current deep canal devices

- elderly or patients with thin ear canal skin
- diabetics
- patients taking coumadin
- profound hearing loss
- bony growths
- narrow, or odd shaped canals

Update on wireless connectivity

- Cell phones
- iPods
- FM systems
Wireless connectivity

- Speakerphone; bluetooth; wired
- Immunity rating for hearing aids and emissions rating for cell phones (1 to 4 - best)
- Performance for telephone coil option (t) & performance for hearing aid mic only (m)
- Summed total should be at least 5

Websites
  - www.hatis.com
  - www.hearingmojo.com
  - www.noizfree.com
  - www.hearwireless.com

Cell phone compatibility

Other new technologies

- Datalogging
- Trainable hearing aids
- Frequency shifting
  - Shifts high-frequency information to lower frequency regions where there are surviving inner (and possibly outer) hair cells

Do we need to do something different diagnostically?
What constitutes a “typical” hearing aid evaluation?

- Pure tone audio
- Monosyllabic speech testing in quiet
- Informational counseling
- Sometimes…LDLs, MCLs, and RECDs, sentence recognition in noise

Are we really testing communication?

Current speech perception tests….

- Don’t take the contextual nature of conversation into account
- Don’t take the interactive nature of conversation into account
- Don’t allow access to conversational repair strategies that occur in real life
The biggest mistake we currently make may be…

- Making hearing aids the focus of our attention, when the focus should be…
- Enhancing communication

How to do it?

- All patients should be told at the outset of the appointment (even during the scheduling) that they will be receiving:
  – a communication needs assessment and
  – an overall individualized communication enhancement plan that will consist of…
    - Education and counseling
    - Communication strategies
    - Individualized auditory training
    - Hearing aids and / or ALDs
    - Group therapy

Relevant Domains for CNA

- Communication expectations and needs
- Sentence recognition in noise
- Tolerance of noise
- Ability to handle rapid speech
- Binaural integration (interference)
- Cognitive skills (working memory, speed of processing, executive function)
- Auditory scene analysis
- Perceived handicap
- Confidence / self-efficacy
- Vision

Communication Needs Assessment

*Measures beyond the audiogram that can be used to define residual auditory function.*

**Objective procedures**

- QuickSIN
- BKB-SIN
- Hearing in Noise Test (HINT)
- Acceptable Noise Levels (ANL)
- Binaural interference
- Dichotic testing
- Letter Number Sequencing -listening span
- TEN
- Rapid (compressed) speech test
- Speechreading
- Dual-tasking
Communication Needs Assessment

*Measures beyond the audiogram that can be used to define residual auditory function.*

**Subjective measures**
- Hearing Handicap Inventory for the Elderly – Screening HHIE-S
- The Hearing Handicap Inventory for Adults (HHIA)
- Communication Scale for Older Adults (CSOA)
- Communication Confidence Test
- Communication partner subjective scales (SAC and SOAC)

**Combined (objective and subjective) methods**
- Performance Perceptual Test (PPT)

---

Need for Rehabilitation

- Traditional approaches
- New developments
  - Cortical Plasticity
  - Auditory training

---

robert.sweetow@ucsfmedctr.org

---

Thanks for listening!