Hearing Aids: The Basic Information You Need to Know

FDA BASICS WEBINAR
May 23, 2012
Presented by Shu-Chen Peng, Ph.D. CCC-A
Scientific Reviewer in Audiology
Center for Devices and Radiological Health
Outline

- Hearing loss
- Basics about hearing aids
  - What are hearing aids and who are they for?
  - How does a hearing aid work?
  - Styles and common features
- Getting the most out of your hearing aids
  - Hearing aid fitting & care
  - Hearing aid benefits & limitations
  - Learning to listen with hearing aids
- Hearing Aids vs. Personal Sound Amplifying Products
- Questions & Answers
Facts about Hearing Loss

- Individuals with hearing loss may be limited in daily oral communication.

- Some facts about hearing loss & hearing aids (NIDCD/NIH)
  - 36 million (or 17%) adult population in the US report some degree of hearing loss.
  - Less than 20% of those with hearing loss who might benefit from treatment actually seek help.
  - Most hearing aid users had lived with hearing loss for 10+ years, and waited until it progressed to moderate-to-severe levels before seeking professional help for hearing aid fitting.
Types of Hearing Loss

- **Conductive**: Middle ear pathology
- **Sensorineural**: Damage at the inner ear (cochlea)
- **Mixed**: Both cochlear damage & outer/middle ear pathology
Degrees of Hearing Loss

- **0 - 20 dB HL**: Within normal limits (WNL)
- **20-40 dB HL**: Mild
- **40-70 dB HL**: Moderate
- **70-90 dB HL**: Severe
- **> 90 dB HL**: Profound
Who are Hearing Aids for?

- Sound-amplifying medical devices to aid individuals with hearing loss. Hearing aids may be useful for:
  - Hearing loss that may or may not be medically treatable.
  - Any type of hearing loss, as long as the individual needs compensation for the reduction in hearing.

- Selection of hearing aids should be based on the type and severity of hearing loss, listening needs, and lifestyle.
Hearing Aids: Basic Components & How They Work

- Electronic components:
  - Microphone
  - Amplifier circuitry
  - Miniature loudspeaker/receiver
  - Battery

- How does a hearing aid work?
  
  www.fda.gov/hearingaids
Hearing Aid Styles

- **Behind-the-ear (BTE) aids:**
  - A plastic case containing most parts; resting behind the ear connected to an earmold
  - Easy to be cleaned and handled, relatively sturdy

- **"Mini" BTE (or "on-the-ear") aids:**
  - A very thin tube connects the aid to the ear canal
  - May have an open-fit ear tip or a regular earmold
  - With “open fit” – Reduced occlusion ("plugged up") sensations, increased comfort, relatively less visible

(Siemens Hearing Instruments)  (NIDCD/NIH)
Hearing Aid Styles

- **In-the-ear (ITE) aids:**
  - All parts contained in a shell, which fills in the ear canal
  - Relatively easier to handle than smaller aids such as ITC & CIC

- **In-the-canal (ITC) aids & completely-in-the-canal (CIC) aids:**
  - All parts contained in tiny cases, which fits partly or completely in the ear canal
  - Smallest in size, which makes it difficult to handle and adjust for some users

(Siemens Hearing Instruments)
Hearing Aid Technology: Analog vs. Digital

- **Analog**
  - Converting physical sound waves into electrical waves
  - Making the continuous sound waves larger

- **Digital**
  - Converting sound waves to their binary format where the sound is represented by a series of 1’s and 0’s
  - Allowing manipulating sounds in relatively flexible ways to achieve more programming options.
Common Hearing Aid Features

- **Directional microphones**
  - Sound from a specific direction amplified to a greater level
  - May help listeners to understand speech in noisy environments

- **Feedback suppression**
  - Squeals suppressed when the hearing aid gets too close to the phone or has a loose-fitting earmold

- **T-coil (Telephone switch)**
  - Sound picked up from the telephone when switching to the "T-coil" setting
  - Help to reduce the chance of hearing aid "whistling"
  - Also works well in environments (e.g., theaters, auditoriums, etc.) where there is induction loop or FM installation
Hearing Aid Fitting

- Get a medical check up from a licensed physician to rule out any medical reasons for hearing loss.
  - In some cases, hearing loss is medically or surgically treatable.
  - Certain medical conditions may underlie the person’s hearing loss.

- Seek hearing aid fitting from a licensed hearing healthcare professional.
  - Audiological exam, including hearing evaluation
  - Provide proper gain and setting: Too much amplification may cause discomfort & additional hearing loss.
Hearing Aid Fitting (cont’d)

Questions to consider:

- What styles and features would fit my daily needs?
- Cost:
  - What is the total cost of the hearing aids?
  - Do the benefits of newer technologies outweigh the higher costs?
- Trial/adjustment period:
  - Is there a trial or adjustment period for me to try out the hearing aids?
  - What fees are nonrefundable if I decide to return the hearing aids?
- Care & Warranty:
  - How should I care for my hearing aids?
  - What is covered during the period of warranty?
  - How long is the warranty? Can it be extended?
Hearing Aid Care & Maintenance

- Keep hearing aids away from any moisture and heat, which may cause damage to the internal electronics.
- Clean hearing aids as instructed.
- Power consumption & battery safety:
  - Turn off hearing aids when not in use.
  - Keep batteries and hearing aids away from children and pets.
- Visit the hearing healthcare professional on a regular basis to have hearing aids inspected.
Hearing Aid Benefits & Limitations

Benefits
- Ability to hear sounds that could not be heard previously, and help oral communication
- Ability to hear speech over the telephone

Limitations
- Do not restore normal hearing
- All sounds, including background noise and undesired sounds, are made louder.
- Sounds, including own voice, might seem too loud at first.
- May need to be replaced every several years
Learning to Listen with Hearing Aids

- Understand your hearing loss & set realistic expectations
- Allow yourself time to adjust and request fine-tuning
- Involve your family members to understand hearing loss and hearing aids
- Learn about communication strategies, including dealing with background noise & utilizing visual cues
- Join support groups
- Learn about Assistive Listening Devices (ALDs)
Hearing Aids vs. Personal Sound Amplification Products (PSAPs)

**Hearing Aids**
- Any wearable sound-amplifying medical device
- Aiding persons with, or compensating for impaired hearing

**PSAPs**
- NOT medical devices; wearable electronic consumer products
- Amplifying environmental sound for non-hearing impaired consumers for use in a variety of listening situations
- Not intended or labeled to compensate for hearing loss
Questions?

For more information about hearing aids, please refer to the FDA website on hearing aids at:
http://www.fda.gov/hearingaids