

Pediatric clinical trials

Implantable Hearing  
Devices

# Devices

- Cochlear implants:
  - electrical stimulation of auditory nerve
  - bypass defective sensory mechanism
  - full or limited penetration
  - from 10 to 20 independent channels
  - tonotopic organization
- Auditory brain-stem implants
  - electrical stimulation of brain-stem sensory mechanism
  - few independent channels
- Middle ear implants
  - acoustic stimulation of intact or defective sensory mechanism
  - not currently pediatric (?)
- Mastoid-bone anchored hearing aid (BAHA)
  - acoustic stimulation of intact or defective sensory mechanism
  - not currently pediatric (?)

# Pediatric issues re cochlear implants

1. Large individual differences of effectiveness for which we have –
  - no pre-surgical predictors.
2. Inadequate candidacy criteria for children with severe loss.
3. Short-term effectiveness = increased auditory capacity -
  - for which we have few pediatric measures.
4. Long-term effectiveness = better/faster language development -
  - which depends also on good habilitative management
5. Limited availability of, and funding for, good management programs.

# In short

1. We can't be sure how much an individual child is likely to benefit from an implant
2. Except for profound and totally deafness, we can't be sure whether an implant will provide more benefit than a hearing aid.
2. Once the child has an implant, we lack short-term measures of its effectiveness
3. Even if the implant provides good auditory capacity, the value of this will not be seen without good habilitative management
4. Programs and clinician/educators who can provide this management are in short supply.

Immediate need re clinical trials

Tools for assessment of auditory  
capacity in infants and toddlers

# Additional needs

1. Research on the correlates of short-term implant effectiveness (i.e., increased auditory capacity)
2. Research on the correlates of long-term implant effectiveness (i.e., spoken language competence, communicative effectiveness, general development, social-emotional development)
3. Actuarial data on short-term and long-term effectiveness to guide candidacy decisions
4. Expanded training of pediatric audiologists
5. Expanded training of auditory-oral intervention specialists