Tips and Tools for Audiological Assessments of Young Children

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Presenters

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Learning Outcomes

- 1) Participants will be able to identify formal assessment tools to use with young children to determine auditory skill acquisition.
- 2) Participants will be able to list ways to informally assess a child’s ability to respond to sound, discriminate speech sounds and identify words.
- 3) Participants will be able to describe how to determine which assessment resources to use based on skill acquisition.

Role of Pediatric Audiologist

- Assess a child’s access to sound across the speech spectrum; with and without current amplification
- Assess families understanding and goal for their child’s access to sound and language
- Assess current amplification using both objective, subjective and discrimination testing: real ear, aided speech scores, etc.
Role of Pediatric Audiologist

- Understand communication options
- Awareness of expanded criteria for cochlear implantation
- Identify tools to assess growth of auditory and language skills

Prerequisites for Assessment

- Video
- Be flexible!
- If need be, sit on the floor bond – build rapport
- If you can spare two minutes, begin a game in order to evaluate turn taking and joint attention. This also builds exploration, curiosity and trust
- Did I say – be flexible?!
- Start fresh with allowing the child time to learn (you to teach) the task
- Involve the caretakers and other interventionists (e.g., early start provider, teacher-of-the-deaf, speech-language pathologist)
What skills do you want a child to have prior to the assessment?

- Awareness / interest in sound – for younger a behavioral response and for older children, a conditioned response
- Speech imitation
- Identification of objects / pictures through selecting or pointing -for younger children it may be objects and older children, pictures

Keep in Mind

- We often try to first assess these skills in a booth, with our voices coming through the speaker. Sometimes this is successful, however, I encourage a trial with the child first
- Know the child’s vocabulary
Auditory Hierarchy

- Detection/Awareness
- Discrimination
- Identification
- Comprehension

Norm Erber

Auditory Development

- Detection/Awareness
  - detects sounds
  - does not understand what they mean but knows a sound is present
Auditory Development

- **Discrimination**
  - recognizes differences between sounds and words through listening but does not necessarily understand the meaning
  - done through recognizing and possibly imitating the differences in duration, pitch, and/or rhythm in words and phrases as well as specific sounds in syllables and words (suprasegmental, segmental)

Auditory Development

- **Identification**
  - builds a listening vocabulary and understands simple words, phrases and sentences
  - beginning auditory memory for concrete items
Auditory Development

- Comprehension
  - understands longer and more complex spoken language
  - answers questions
  - uses thinking skills such as inference, Theory of Mind
  - engages in conversations with different people in a variety of settings

Assessment: Formal and Informal
Birth to 6 months

- Relying primarily on objective audiological assessments: ABR, CAEP, simulated or on ear measurements
- Informal observations
- Look at child’s overall development
- One validated, formal assessment is the LittLEARS® Auditory Questionnaire
- Informal assessment via observation should include determining how the child is adapting to the hearing aids and if the child is responding to sound/speech or demonstrating any pattern perception in a controlled environment

LittLEARS® Auditory Questionnaire (LEAQ)

Pediatric Assessment Tool

- Intended for children 0-2 or for children with a hearing age of less than two years
- Assesses auditory children in the preverbal developmental stage (up to 24 months)
- Based on normative data from children with normal hearing birth to 24 months

Presented in Partnership with
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LittlEARS® Auditory Questionnaire

Pediatric Assessment Tool

• Designed for parent observation in natural environment
• Meets the need of assessing very young children who are at an age where picture pointing or answering questions is not appropriate and assessment is primarily through observation

LittlEARS® Auditory Questionnaire

• Quick and easy administration
• 35 Questions
• Questions in age-dependent order
• Total score = sum of all Yes answers
• Available in English and Spanish
LittlEARS® Auditory Questionnaire

Score Sheet

- Use once and compare to trajectory or track progress over time
- Assists in development of early listening goals
- Values within the blue area are considered critical

LittlEARS® Auditory Questionnaire

Research with LEAQ and children with cochlear implants

- 63 children who received a CI before the age of two assessed in a longitudinal study
- Results demonstrated they reached total scoring on the LEAQ by 16 months (on average) after activation of the CI

(May-Mederake et al., 2010)
A Child’s Journey
Developmental Milestones (Birth to 6 Years)

• MaryKay Therres, M.S., CCC-SLP, LSLS Cert. AVT
• Ingrid Steyns, M.S., CCC-SLP, LSLS Cert. AVT

Purpose
• determine current levels of functioning
• monitor children’s acquisition of skills necessary for listening and spoken language communication and learning
• select appropriate goals for ongoing development
• identify areas of concern
• aid in counseling families
8 Domains

Skills

0 – 2 years of age lists skills in 3 month intervals (e.g. 12 – 15 months, 15 – 18 months)

With 6 month range included (e.g. 12 – 18 months, 18 – 24 months)
Skills

2 – 6 years of age lists skills at 6 month intervals (e.g. 2 – 2 ½ years, 2 ½ - 3 years)

With yearly range included (e.g. 3 – 4 years, 5 years)

Marking

- Goal
- Emerging
- Mastery

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6 – 12 months

- Parent Report
- VRISD Visual Reinforcement Infant Speech Discrimination
- BOA and VRA
- Informal could include receptively assessing single words and short phrases: where’s mama, go bye-bye

12 – 18 months

- Formal assessment in the booth should be via VRA
- VRISD
- Real Ear Measurements
- The Ling sounds should can be presented
- Pattern perception should be assessed through informal means or by utilizing the Early Speech Perception Test (ESP)
- An auditory skills curriculum such as LittlEARS®
- A Child’s Journey
- Receptively: Recognizes simple phrases and can point to body parts - begin introducing SRT toys
18 – 24 months

- Formal assessment in the booth via VRA
- VRISD
- Real Ear Measurements
- The Ling sounds should can be presented: detection vs. discrimination
- Pattern perception should be assessed through informal means or by utilizing the Early Speech Perception Test (ESP)
- An auditory skills curriculum such as LittlEARS®
- A Child’s Journey
- Receptively: Recognizes simple phrases, can point to body parts, SRT via pictures or toys

24 – 30 months

- Formal assessment in the booth via VRA
- VRISD
- Real Ear Measurements
- The Ling sounds should can be presented: detection vs. discrimination
- Pattern perception should be assessed through informal means or by utilizing the Early Speech Perception Test (ESP)
- An auditory skills curriculum such as LittlEARS®
- A Child's Journey
- Receptively: Recognizes simple phrases and can point to body parts
30 – 36 months

- Formal assessment in the booth should be via VRA or conditioned play.
- SRT
- Northwestern University-Children’s Perception of Speech (Nu-CHIPS) or Word Intelligibility by Picture Identification (WIPI) should be administered.
- LINGs discrimination – be sure to use objects or pictures in order to assess discrimination vs articulation errors
- ESP
- Multisyllabic Lexical Neighborhood Test (MLNT)

Open- and Closed-set Task©

Developed by:
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Professor Emeritus
Speech, Language, and Hearing Sciences
Purdue University
Description

- Objective and developmentally appropriate, with-in child, criterion-referenced tool for assessing toddler’s ability to imitate and understand spoken words during the first 2 years of implant use
- Administer at 6 month intervals (e.g., at 6, 12, 18 months post-implant)

Target Population

- Toddlers (e.g., children 12 to 36 months of age)
- Children who are older and receive a cochlear implant later
- Children who have disabilities in addition hearing loss
Contents

- Manual
- Photo Book
- Score sheets for three word lists

Open-set Task

- Adult says the word from the targeted word list and child imitates
- Child’s production is transcribed on score sheet
Closed-set Task

- After child imitates, then shown set of three pictures and asked to identifying which one it is

3 Scores

Phoneme Accuracy: provides a measure of child’s ability to imitate vowels and consonants in words
- Ignore voicing errors
- Score is % correct phonemes)
3 Scores

Word Acceptability: provides an estimate of intelligibility of child’s spoken words by comparing to adult

- 2 phonemes AND correct # of syllables
- Score is number correct out of number administered (%)
## Case Studies

### Mellie: CIs at 13 months of age, O&C administered at 6, 12 and 18 months post-CI

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<th>List 1</th>
<th>List 2</th>
<th>List 3</th>
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<tr>
<td><strong>Phoneme Accuracy:</strong></td>
<td>37%</td>
<td>66%</td>
<td>74%</td>
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<td><strong>Word Accuracy:</strong></td>
<td>20%</td>
<td>80%</td>
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<td><strong>Word Comprehension:</strong></td>
<td>8</td>
<td>16</td>
<td>19</td>
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(total of 20)

### Case Studies

### Mollie: CIs at 13 months of age, O&C administered at 6, 12 and 18 months post-CI

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<tbody>
<tr>
<td><strong>Phoneme Accuracy:</strong></td>
<td>14%</td>
<td>31%</td>
<td>38%</td>
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<tr>
<td><strong>Word Accuracy:</strong></td>
<td>0%</td>
<td>20%</td>
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<tr>
<td><strong>Word Comprehension:</strong></td>
<td>9</td>
<td>18</td>
<td>20</td>
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(total of 20 possible)
Case Studies

Millie: CIs at 13 months of age, O&C administered at 6, 12 and 18 months post-CI

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<tr>
<td>19 mth</td>
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<td>25 mth</td>
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<td>31 mth</td>
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<td>17%</td>
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<td>9%</td>
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<tr>
<td>Word Comprehension</td>
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<td>4</td>
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(total of 20 possible)

3 – 5 years of age

- Formal assessment in the booth should be via conditioned play. If appropriate to the child’s auditory skill level, the ESP, MLNT, LNT, CNC, PSI, WIPI, NU Chips GASP or West Ontario High Frequency Test may be administered.

- Informal: At this age, administration of these tests may also be completed by use of speech reading versus auditory only to obtain informal information regarding the child’s skills. If speech reading is provided, it must be noted in reports that it is not valid testing however it does provide useful information. Sign language Support can also be useful in assessing vocabulary knowledge in picture pointing tasks.
5 – 7 years of age

- Formal assessment in the booth should be via conditioned play or conventional. If appropriate to the child’s auditory skill level, the WIPI, MLNT, LNT, CNC, BKB, Pediatric AzBio, GASP or West Ontario High Frequency Test may be administered.
- Informal: At this age, administration of these tests may also be completed by use of speech reading versus auditory only to obtain informal information regarding the child’s skills. If speech reading is provided, it must be noted in reports that it is not valid testing however it does provide useful information.

8+ years of age

- Formal assessment in the booth should be via conventional audiometry. At this age, if appropriate to the child’s auditory skill level, previous tests mentioned may be administered along with addition of Lexical Neighborhood Test (LNT), Pediatric AZ Bio Sentences, BKB or CNC
- Informal: At this age, administration of these tests may also be completed by use of speech reading versus auditory only or auditory only in noise to obtain informal information regarding the child’s skills. If speech reading or in noise is provided, it must be noted in reports that it is not valid testing however it does provide useful information.
Ling sounds

- Everyone knows the importance of Ling sounds. How do we as audiologists use these and what information do we want to get from them.
- Know your speech acoustics (Or have a chart at the ready!)
- video

Modifying/Adapting

- Objects vs ling cards vs imitation
- You have to work in the child’s zone of development for them to learn. This is testing: Be in the zone. Skill versus age.
  We do not always start off with – this child cannot carry out the LNT list, drop back to the MLNT: Refer to the Pediatric Minimum Speech Test Battery Protocol Figure 1
- If using a picture pointing, closed set task, is it an access issue or is it a vocabulary issue. If the child is bi or trilingual, have the care giver model as well.
What is our role?

- It is our job, along with the speech language pathologist, to assess what that child is doing with their auditory access.
- Their language skills are part of our evaluation – if it is possible, reach out to other team members supporting the child.
- We use observation to support the information we obtain through formal testing.
- Age is just a number! Test to that particular child’s ability, not their age.
- Remember the great Marion Down’s: No age is too young to test! We are working with the whole child, not just their ears.