Online Session 1

Aural Hab: Child

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Supporting Success for Children with Hearing Loss

This Week’s Learning Objectives
You will be able to ...

1. Describe key elements of working effectively with families (Parent and Professional Partnership)
2. Describe formant relationships of various speech sounds
3. Describe a child’s hearing loss in terms of audibility for classroom speech at a distance and during typical instruction
4. Be able to report recommended criteria for childhood hearing screening

This Week's Learning Objectives

Professional & Parent Partnerships

Kris English Presentation:
• Feelings of loss are not a cycle, more like a roller coaster

Denial has a purpose
• Provides time to gather inner strength
• Provides time to gather information
• Provides time for “readiness”
• Is a legitimate coping strategy

Not just a river in Egypt....

What babies listen for:
• Babies recognize mom’s voice (2 hours old)
• Babies choose listening to mom’s voice more than unfamiliar women’s voices (1 day old)
• Babies are more interested in mom’s Infant-Directed Speech than Adult-Directed Speech
• Anybody’s IDS is more interesting than ADS
• Babies can perceive differences in timing, pitch, intensity, vocal quality
• Fernald (1985): Infants are “biologically predisposed to respond to human voice”

HEARING AS BONDING
It means 1) becoming calm, attentive 2) falling in love with family 3) becoming a 2-way communicator

What Babies Listen For:
• “The love in our voice” – mother, ISD, prosody
• What it Means to Them:
  - What am I learning AND how do I feel?
• How to Make Sure They Hear It:
  - The ELF to find out what baby can hear
  - “Mindful listening” for “auditory imprinting”
Tie early listening to reading

Our Challenge
- To help families value hearing, even as rest of world takes it for granted
- To use devices because hearing MATTERS
- Matters to family, and then to child

Make It Yours
- Your next patient is a parent with a 6-week-old baby. You diagnosed a moderate hearing loss last week and they are back for further discussion and a hearing aid evaluation.
  - Mom is there because she knows she should follow up but she wants this all to go away.
  - How will you help her understand the hearing loss and what it means to bonding with her baby?
  - What tools/strategies could you use to make the case for hearing aids NOW?
  - What can you share with her that she can bring home to her husband and extended family so she can explain the hearing loss to them? Focus on key points.

Model of Child Aural Habilitation

Assessment
Define the impact of the hearing loss on life function
Under what situations is the child’s ability to function impaired?
When/how will participation be restricted?
Talk about abilities not dB

Personal Factors – Skills
- Language
- use/communication
- Socialization skills
- Psychosocial/self-concept
- Additional Learning Challenges

Environmental Factors
- Speech perception under varying conditions
- Ability to attend / fatigue
- Speechreading benefit
- Accommodations currently in various environments

Get the Data

Interpretation of the Data
- Need to ‘make the audiogram come alive’
- Limitation – depicts only thresholds in an unrealistic listening environment
- Strength – ‘apples to apples’ – every child with hearing loss has an audiogram

Challenges
1) Hearing loss is invisible
2) If a child responds to any part of the something said, it is assumed he heard all of what was said
3) Ability to understand well in a quiet setting is assumed to apply to all settings

Interpreting Abe’s ADT results

- Age equivalent for Abe (age 9 years)
  - Quiet (score of 26) = 5.0 – 7.5 age equivalence for average performance
  - Noise (score of 20) = 4.0 – 4.5 age equivalence

<table>
<thead>
<tr>
<th>Condition</th>
<th>Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>Quiet</td>
<td>26</td>
</tr>
<tr>
<td>Noise</td>
<td>20</td>
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</tbody>
</table>

Value for access to classroom communication & comparison to peers? Need for visual supports? FM? Other accommodations?

AUDIBILITY ≠ SPEECH UNDERSTANDING

- An analogy for Audibility – (Picture Puzzle) Recognizing the subject of a picture puzzle depends on what pieces are missing and the complexity of the picture. Opportunity
- An analogy for Speech Perception – (Text Puzzle) Recognizing the content of a puzzle made out of written words depends on knowledge of vocabulary, syntax, the general topic and effort to figure out the missing pieces, especially when there is new vocabulary words and concepts. Function
Results in %

<table>
<thead>
<tr>
<th>Test Condition</th>
<th>Age 3-5 M-F</th>
<th>Age 6-8 M-F</th>
<th>Age 9+ M-F</th>
</tr>
</thead>
<tbody>
<tr>
<td>Quiet 50 dB</td>
<td>98-98</td>
<td>98-98</td>
<td>99-96</td>
</tr>
<tr>
<td>Quiet 35 dB</td>
<td>95-96</td>
<td>97-98</td>
<td>98-96</td>
</tr>
<tr>
<td>50 dB @ +5 S/N</td>
<td>93-94</td>
<td>94-95</td>
<td>97-93</td>
</tr>
<tr>
<td>50 dB @ 0 S/N</td>
<td>91-92</td>
<td>91-93</td>
<td>95-93</td>
</tr>
<tr>
<td>35 dB @ 0 S/N</td>
<td>90-92</td>
<td>91-90</td>
<td>91-90</td>
</tr>
</tbody>
</table>

You need to 'own' this!

- 1999 data from Bodkin, Madell, and Rosenfeld
- 126 typically hearing children ages 3-17 years
- Listening at 35 and 50 dB HL.
- Age appropriate open set single word lists (NU-C, PRK, W-22)
- Competing noise = 4 talker babble.

The typical child performed at 90% or better = GOAL

Make it Yours!

- Word discrimination testing is very routine for audiologists, yet what it tells us about how well a person will be able to perceive speech is much more valuable than the audiogram.
- One of your patients will be going to a new school to start 1st grade. He has a 35-65 dB loss bilaterally and is a good hearing aid user. His WDS in quiet is 84% and in noise is 72%. What would you write in the report to the school that would help them understand this is a concern?
Childhood Hearing Screening

- Newborn hearing screening established in US
- Still at 35% loss to follow up for UNHS fails
- Focus is now more on screening for ages 6 months – preschool (who does this?)
- School hearing screening used to be very common, multiple grades
- Now often not done at all in schools or only for grade K (1 + 2)
- Part of special education eligibility but can often be addressed very minimally

AAA Childhood Hearing Screening Guidelines

- Released in 2011 – 78 pages RESOURCE!
- AAA endorses early detection of hearing loss in children using evidence-based hearing screening methods
- Hearing loss is the most common developmental disorder identifiable at birth and prevalence increases throughout school-age
- Under identification of HL has broad economic effects as well as impact on educational, cognitive, & social development
- Identifying new or emerging hearing loss in one or both ears followed by appropriate follow-up for referral and diagnosis/treatment are the first steps to minimizing these effects. https://successforkidswithhearingloss.com/resources-for-professionals/child-hearing-screening

Pure Tone Screening

1. Perform biological check on pure tone screening equipment prior to daily screening.
2. Screen populations age 3 (chronologically and developmentally) and older using pure tone screening.
3. Perform a pure tone sweep at 1000, 2000, 4000 Hz at 20 dB HL
4. Present a tone more than once but not more than 4 times if a child fails to respond.
5. Only screen in an acoustically appropriate screening environment.

6. Lack of response at any frequency in either ear constitutes a failure.
7. Rescreen immediately.
8. Use tympanometry in conjunction with pure tone screening in young child populations (i.e., preschool, kindergarten, grade 1).
9. Screen for high frequency hearing loss where efforts to provide education on hearing loss prevention exist.
10. Minimum grades to be screened: preschool, kindergarten, and grades 1, 3, 5 and either 7 or 9.

Tympanometry Screening

1. Calibrate tympanometry equipment daily.
2. Tympanometry should be used as a second-stage screening method following failure of pure tone or otoacoustic emissions screening.
3. Use defined tympanometry screening and referral criteria: a 250 daPa tympanometric width is the recommended criterion. If it is not possible to use tympanometric width then 0.2 mmhos static compliance can be used as the criterion. A final choice for failure criterion is negative pressure of -200 daPa to -400 daPa however it is not appropriate for this criterion to stand alone to elicit referral.
4. Young child populations should be targeted for tympanometry screening.
5. Use results of pure tone or OAE and tympanometry rescreening to inform next steps.
Rescreening

1. Rescreen with tympanometry after a defined period: after failing the immediate pure tone rescreening and in 8-10 weeks for children failing pure tone or OAE screening and tympanometry.

2. Do not wait to perform a second stage screening on children who fail pure tone screening only.

OAE Screening

1. Use only for preschool and school age children for whom pure tone screening is not developmentally appropriate (ability levels < 3 years).
2. Calibrate OAE equipment daily.
3. Maintain primary DPOAE levels at 65/55 dB SPL.
4. Select DPOAE or TEOAE cut-off values carefully.
5. Default settings may not be appropriate.
6. Screening programs using OAE technology must involve an experienced audiologist.
7. Children failing OAE should be screened with tympanometry.
Acoustic reflex testing, reflectometry and hearing screening using speech materials are not recommended.

Realities

• It is not enough to screen if there is no system of comprehensive follow up
• In three school districts from which data were collected, information following referral was returned to the school in only 10-20% of cases.
• One Colorado school district documented that approximately 40% of the information returned following hearing screening was by families of preschool children, with return rates decreasing in number as children became older.
• It remains critical for the individual(s) coordinating the school hearing screening program to develop relationships with the local medical community, inform them of the screening protocols used and encourage their collaboration in returning results of medical or audiological evaluation following a hearing screening referral.

Resources

• Tools for Training Hearing Screening Providers
  - Developed by Diana Emanuel of Towson University in conjunction with the Baltimore City School System
  - Pure-Tone Hearing Screening in Schools: Revised (video)
  - Common Mistakes (video)
  - Commonly Asked Questions (video)
  - Complete Notes for Pure-Tone Hearing Screening in Schools: Revised Video
  - Notes on screening procedure only
  - Note on Common Mistakes Video
  - Notes on Commonly asked Questions Video
  - Sample test questions for all three videos (multiple choice format)
  - Practical evaluation checklist
  - Useful websites

Make it Yours!

Hearing loss is not being identified because early childhood and/or school hearing screening practices are not in place, or are not effective.

You are a new community audiologist. You want to truly serve the hearing needs of your community and also increase referrals.
• You know what hearing screening practices are recommended and why it is important
• How could you go about finding out about the current state of child hearing screening in your area?
• This is a systems issue and rarely a single person issue. What challenges might you face? What could you do to initiate systems changes?

Preview for Next Week

• Legal rights of children with hearing loss
  - Early childhood – birth to 3 years
  - School-age – 3 to 21
  - Continuum of Educational Placement Options
  - Pertinent Audiology Services under SpEd Law
• Expanded Core Curriculum for Children who are Deaf/Hard of Hearing
• Common Core Standards (very briefly)
• Transition to Preschool
  - Special challenges for the audiologist