The Pediatric Audiologist’s Role in Supporting Communication Access at School
Karen L. Anderson, PhD, Director, Supporting Success for Children with Hearing Loss

Objectives
1. describe the audibility necessary for auditory learning.
2. describe the communication challenges faced by students with hearing loss.
3. state specific assessment and other information to be shared with the parents and school.

Introduction
For every 1 child with severe to profound hearing loss there are 2 with moderate loss and about 4 with mild loss. About half or more of children who are candidates, receive cochlear implants. Most children have useable residual hearing.

“Given the opportunities to learn (access) language (vocab, R/E, pragmatic, morphology, literacy...) and academic skills (knowledge, comprehension, application) through appropriate and efficient modes of communication, (accommodations & self-advocacy) a learner with a hearing impairment should progress in expected patterns of growth and achievement.” (issue of comorbidity). Bunch, G. & Meinyk, T. (1989). American Annals of the Deaf

Early Childhood Issues & Recommended Practices

“The math of hearing aid wear: If a baby with hearing loss is awake for 8 hours a day and only wears hearing aids for 2 hours then he will only be able to ‘tune in’ to the hearing world 25% of the time. It may take up to 4 years for his first word. A school-aged child is awake about 100 hours/week. If he only wears hearing aids in school, that is about 30 hours/week. If the child is only wearing hearing aids 30% of the time then we can expect 30% achievement since listening and language development occur during all waking hours.”

Counseling is a professional relationship that empowers individuals/families to accomplish their development, education, mental health...goals. See more on counseling practices at the end of these Session Handout notes.

Listening Bubble – Early Listening Function Checklist: http://successforkidswithhearingloss.com/tests

Outcomes of Children with Hearing Loss: 2015 study, Moeller et al. Relevant findings for pediatric audiologists:
Five research investigations all sharing same protocols. Longitudinal study of 317 children with hearing loss compared to 117 with typical hearing – followed for at least 3 years
Children who are hard of hearing:
1) Optimized audibility makes a difference to language and auditory development, even for children with mild HL
2) Aided audibility correlated with word recognition in quiet for 2-6 year olds and in noise for 7-9 year olds
3) Over 30% of children were found to have under fit hearing aids. 22% had low audibility, 19% had decreasing levels of audibility
4) 84% of children had stable hearing thresholds – need for ongoing assessment!

Help families understand the impact of hearing loss:
 a) Early Language Development for Children with Hearing Loss – Questions to Ask the Family
 b) Is the child showing signs of a vocabulary growth spurt after about 20-25 months? A quadrupling of vocabulary typically occurs within the next 6 months. If not, why?
 c) Inquire about speech development!
   i. 6 consonants should appear in a typically hearing child’s speech by age 3
   ii. An additional 7 should appear by age 4 (typical hearing)
   iii. For a child with hearing loss, as long as 10 consonants are produced by age 5 it is likely that the child will develop useful speech (late ...but eventually)
   iv. Development of an auditory feedback loop – through optimal, consistent amplification, is the key to early speech sound development

Take home message: If a family wants their child to speak, ask about # of emerging consonants.

At age 18 months does he have 8 consonants and 9 words (or more?). Goal is for at least 10 consonants by age 5 years (13+ is typical at age 5).

Specifics to keep in mind when fitting hearing aids on children:

- WRDC results in better speech recognition in quiet and noise for pediatric hearing aid users
- Children with hearing loss require greater audibility (20 dBHL) and frequency bandwidth (8-10KHz) to achieve equivalent levels of speech recognition as typical peers
- Under fitting hearing aids on children is rampant!!! 30% not using optimized aids.
- Need to allow ‘head room’ for changes in hearing.
- Directional mics can be a disadvantage in school as a child may not always be able to orient to look at speaker. Consider carefully for young children.
- Limited data on fitting advanced/new hearing aid features on children. Verify fittings to collect efficacy evidence. ALWAYS allow for FM use. Must, must, must validate!
- Using Manufacturer recommended settings may severely limit a child’s audibility.

Red Flags for Hearing Aid Fitting Issues (Jane Madell, Audiology Online)

- If a child is not making appropriate progress there is a reason.
- Acoustic access to intelligible speech is critical to develop the auditory brain – strive for 20dB HL aided thresholds. **DO AIDED AUDIOGRAMS!** (NBN/Fresh Noise)
- Performing word discrimination in quiet is **insufficient** to determine if a child can really use hearing to process soft speech. Need to perform WDS at 35 dB in quiet and +5 S/N
- Family/child receive therapy support for listening and language development from an experienced person
- Specific issues:
  - Child resists wearing the aid
  - Poor response to high frequency stimuli
  - Distorted speech (vowels, dropping consonants)
  - Any dramatic change in performance

Red Flags Summary: Recognize if the child’s speech lacks age appropriate consonant sounds. Confirm that the devices are working. Ensure that the child is hearing throughout the frequency range, hearing soft speech, hearing in noise. When in doubt, try a different aid.

There is no substitute for appropriate fitting practices (Per Leavitt, Flexer, et al, Sept 2016, Hearing Review)

Hearing aids that are under-fit can dramatically compromise word recognition, **even when an external microphone is used** (FM). Premium-level hearing aids cannot overcome communication problems in noise when these aids are under-fit relative to a well-established target. The problem of hearing aid under-fitting is compounded as the original default program of the hearing aid is typically the program used for wireless transmission. So even with use of a remote microphone, insufficient gain of the default program will compromise the user’s speech recognition.

It has long been recognized that children who are deaf or severely hard of hearing **plateau in reading about grade 4.**

Potential impact of hearing loss on reading ability:
(1) Children’s morphology errors tend to be ones of omission.
(2) Morphology ability was highly related to their achievement on a standardized reading measure; decreasing achievement over time
(3) Children with cochlear implants tend to have difficulty learning tense markers because of their early deprivation of auditory input and the nature of the electrical signals they receive. This causes them to have greater difficulty perceiving morphemes with shorter duration and/or weaker energy as compared to surrounding content words.
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It is imperative for students to be provided with access to and knowledge of audibly salient components of English as they are critical for gaining access to the vocabulary and grammar common in reading materials beyond the third grade. Optimally fit devices = better language + reading

Hearing aid use (hours of wear per day) in children
- Hearing aid retention information and FREE BROCHURES can be ordered/downloaded at:
  [http://successforkidswithhearingloss.com/hearing-aids-on](http://successforkidswithhearingloss.com/hearing-aids-on)
- Biggest challenges to achieving full-time amplification wear are:
  - Off-on-off-on transitions throughout the day
  - Child temperament issues
  - Activity-based issues (in the car or stroller)
- Strategies to share with mom:
  - Stick to the schedule – no weekends or days ‘off’!
  - When he gets up and you change his diaper put his hearing aids on – every time. He will soon associate two activities. As he ‘graduates’ into underwear it will be natural for him to recognize that he needs to wear his hearing aids all day, every day just like he needs to wear his underwear.
  - Keep the hearing aids in the same place (‘hearing aid house’)
  - Teach him that he needs to ask an adult to take off the hearing aids. When he asks to have them off consider if it is too noisy, he may have an ear infection, a battery may be dead, the hearing aids are malfunctioning, etc.
  - Tantrums happen. When he calms down distract him with something he likes (i.e., reading a book) and try again. Do not let the hearing aids become a way that he ‘misbehaves to get your attention’
  - It is natural for him to be curious about his hearing aids. Use hearing aid accessories and strategies to keep the hearing aids on and safe from him removing them, taking them apart, swallowing the batteries.
  - See strategies by parents: [https://successforkidswithhearingloss.com/hearing-aid-retention/](https://successforkidswithhearingloss.com/hearing-aid-retention/)

What can YOU do to get parents to believe that hearing loss WILL impact their child’s development?
1. Try not to use the label ‘mild’, ‘moderate’
2. Talk about reduction to the child’s “listening bubble” (i.e., ELF results from across room)
3. Simulate the hearing loss (earplugs, demos)
4. Use their experiences with communication difficulties with a simulated hearing loss or their observations (ELF) to help them understand their child’s learning challenges with this much hearing loss.
5. Support families with different strategies to achieve full-time hearing aid wear

Many resources for parents on the Supporting Success Website! *Attitude is Caught, Not Taught. Info on Mild Loss…*
*Relationship of Hearing Loss to Listening and Learning Needs: 9 hearing loss versions*

School-Age Issues & Recommended Practices
- Only 1 out of every 100 IEPs is for a child found eligible for special education primarily due to hearing loss. [http://www.gao.gov/new.items/d11357.pdf](http://www.gao.gov/new.items/d11357.pdf)
- *When you hear hoof beats they are usually horses, not zebras.* Hearing loss is not a disorder, like LD or language disorders. It is not an attention disorder, like ADHD. It is not a cognitive disorder, but academic delays and some functional classroom issues are common. Hearing Loss can LOOK like every one of these issues. Kids with hearing loss are Zebras, not Horses, because hearing loss is a communication access issue that can cause challenges in learning at the same pace as hearing peers.
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- Classroom teacher study: half of the teachers thought hearing loss and academic problems were not linked. Teachers accused students of daydreaming because they participated inconsistently. *Ross, Brackett, Maxon, 1991.*
- Age appropriate speech by age 3 is a triumph of the hard work and dedication of families but this good start does NOT inoculate the child from developing learning gaps due to access issues in the future.

Families Need to Advocate!
- The average result of ‘good early intervention’ is low average language ability (SS 85-88)
- Paired with ‘good speech’ the impact of the hearing loss is not recognized
- Schools are increasingly finding children who are hard of hearing to be ineligible for special supports and services
- Models of DHHT support are changing; fewer specialized support services are being seen across the US
- Families need YOUR SUPPORT to help them ‘make the case’

Hidden barriers: Noise and distance is just as much a barrier to a student with hearing loss as a narrow doorway is to a student in a wheelchair. ANALOGY: *ADHD medication* helps children with this disorder to focus and therefore function in the classroom. Distance and noise is every bit as much of an impediment to student focus as asking a child with ADHD to perform well without medication.

Language Learning during ages 4-7 years: Yoshinaga-Itano, Oct 2010.

2014 Title II ADA Policy Clarification
[http://www2.ed.gov/about/offices/list/ocr/letters/colleague-effective-communication-201411.pdf](http://www2.ed.gov/about/offices/list/ocr/letters/colleague-effective-communication-201411.pdf)

Requires schools to ENSURE that communication is as effective for students with hearing loss as peers. Effective communication is provided through appropriate auxiliary aids and services. Thus “affording an equal opportunity to obtain the same result, to gain the same benefit, or to reach the same level of achievement as that provided by others” and “to participate in and enjoy the benefits of the district’s services, programs and activities.”

- Schools must comply; puts the onus on the schools
- Auxiliary aids and services must be provided in a timely manner – as soon as requested; don’t wait for the IEP/evaluation process to be completed
- Schools must honor the individual’s choice UNLESS they can prove that an alternative is as effective as that provided to students without disabilities
- Applies to ALL students with hearing loss, not just those who qualify for IEPs or who have 504 Plans
- Applies to perceiving peer-to-peer communication, not just teacher instruction

The clarification by ADA has shifted the focus to: Can the student communicate as effectively as peers? (perceive verbal instruction & class peers). What is needed to ensure that the hearing loss will not interfere with effective understanding in class, thereby limiting the students’ opportunity to reach the same level of achievement as peers without hearing loss? Go to [http://successforkidswithhearingloss.com/access-ada](http://successforkidswithhearingloss.com/access-ada) For Case Law example, Cascading Impact of Hearing Loss handout for administrators, What are Auxiliary Aids and Services and Accessibility Considerations Worksheet.

ADA & IDEA – Different ‘bars’ for achievement
- IDEA = Schools must provide educational benefit for students but do not have to guarantee that the student reaches his or her full potential.
  - Example: Student with 130 IQ achieving Cs in middle school (assume student is a motivated worker)
- ADA = affords an equal opportunity to obtain the same result, to gain the same benefit, or to reach the same level of achievement as others.
  - If a child with a 130 IQ who had a hearing loss, with appropriate auxiliary aids and services, should be able to achieve at a rate/level expected of the cognitive potential

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Pivotal Point: To receive specialized instruction, we must first demonstrate adverse educational affect.

1985 – most children identified around age 2; a language delay of 2+ years was typical. Children starting preschool had 50-200 words and varying degrees of speech intelligibility issues. Special education was assumed necessary due to very evident delays.

2016 – most children identified at birth, hearing aids provided in first few months, CI before age 1.

School readiness is related to early intervention success and evidence of additional learning issues. There are many more “high DHH performers”

IDEA – No guarantees

Just because a child has a hearing loss does not mean the degree will meet the state criteria for hearing loss. Even if the hearing loss does meet criteria there must be evidence (data) of adverse educational affect. Even if there is evidence of adverse educational affect it is up to the team to decide what services the child needs. No guarantee of FM – without YOUR data. No guarantee of DHH support, without someone making the case for necessary skill building that will allow the child to benefit from the general curriculum.

504 Plans – No guarantees

A documented hearing loss, by nature, fits the criteria of a life-limiting condition necessary for qualification for a 504 accommodation plan. Schools consider ‘accommodations’ differently. Many/most are resistant to funding anything on a 504 Plan, such as an FM, because there is no budget. Many will not allow special ed personnel (DHH teachers/educ auds) to provide support at the child is not SpEd eligible.

What this means: Management of the school-age child requires

Data gathering to clearly show adverse performance in classroom listening situations. Relating speech perception to challenges with discriminating speech (what sounds?) in different conditions (quiet/close, far/noise, etc). Specifically providing information in a report that mentions the Special Considerations requirements – opportunities for peer interactions, social and emotional factors. Make the case not only for FM technology but also for necessary skill building.

IDEA and evaluation for special education eligibility

§300.304(b)(1) Use a variety of assessment tools and strategies to gather relevant functional, developmental, and academic information about the child, including information provided by the parent, that may assist in determining whether the child is a child with a disability

§300.304(b)(2) Not use any single measure or assessment as the sole criterion for determining whether a child is a child with a disability and for determining an appropriate educational program for the child;

§300.304(c)(2) Assessments and other evaluation materials include those tailored to assess specific areas of educational need and not merely those that are designed to provide a single general intelligence quotient.

Gather Data to Support the Need for Access

Scenario: Child comes in for a before school hearing check up.

1. Check hearing levels – any shifts?
2. Check hearing aids – still OPTIMAL amplification?
3. Check aided hearing level – still OPTIMAL audibility?
4. Get data on precision listening – specific speech sounds ‘missed’ (Iowa Media Consonant Test, ELFLing)
5. Get data on functional listening – ability to process speech from various conditions typical of a school setting (Functional Listening Evaluation, Listening Inventory For Education checklist)
6. Get the parent’s input – Mom completes during testing (Children’s Home Inventory of Listening Difficulties)
7. Put it all together in a report to the school
   - Mention ADA and ACCESS requirements!

Speech Audibility Audiogram for Classroom Listening: http://successforkidswithhearingloss.com/speech-perception/
Also the location of the ‘norms’ for typical listeners (95% in quiet and 90% in noise, minimum).
Interact-AS speech to text video:
https://www.youtube.com/watch?v=lb86CL39_bY&list=PLuuGt_6iNxFrI9hb2JwEKnb30YZZMjSs&index=4
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Learning about a child’s hearing loss and its implications:
- Use the Functional Listening Evaluation as a way to get data but also to discuss results with the student
  - What kinds of sounds did he struggle with?
  - Were there sentences that didn’t make sense? How often?
  - Talk about hearing loss in relation to missed parts of speech/sentences – not dB loss on an audiogram
- Ask informally ages 4-7:
  - Are there times you don’t hear? Like when?
  - How do you know you didn’t hear everything?
  - Use the Ida My World Tool with situations and people as a basis for discussing different situations. Use CHILD questions as a basis for the types of situations to ask about.
- Age 8+ Administer the CHILD or the LIFE-R Student Appraisal
  - How well can he hear/understand in quiet, noisy, close, far, social, media situations?

Access is the name of the game: Goal: access to the general education curriculum. How:
1. Maximize technology – hearing/visual
2. Teacher provides accommodations to make verbal instruction and class discussion as fully accessible as possible
3. Student learns skills to allow him to fully benefit from classroom communication – Expanded Core Curriculum

Personal FM versus Sound Field FM information:

Legal Requirements:
IDEA Sec. 300.113. (a) Each public agency must ensure that hearing aids worn in school by children with hearing impairments, including deafness, are functioning properly. (b) Each public agency must ensure that the external components of surgically implanted medical devices are functioning properly.

Setting up an FM system does not meet IDEA documentation rules. Schools must collect data to verify that the FM was available in the classroom – every school day – and to note whether the FM was used or not. [http://successforkidswithhearingloss.com/wp-content/uploads/2014/06/Setting-up-FM-system-does-not-meet-IDEA-documentation-rules.pdf](http://successforkidswithhearingloss.com/wp-content/uploads/2014/06/Setting-up-FM-system-does-not-meet-IDEA-documentation-rules.pdf)

Due to a ‘listening gap’ does the student need additional visual accommodations? What are the choices?
- The student just works harder (and harder!)
- Pull out for more specialized instruction at the expense of missing more classroom information
- Sign language interpreter/ cued speech transliterator
- Speech-to-text option: CART or Captioning system (7+ sec delay) or Speech-to-text translation software (1-2 sec)

Key Issues when considering the need for captioning: The Speech-to-Text Readiness Checklist

Management is not equal to providing amplification: Amplification alone cannot overcome the difficulties students with hearing loss have with the auditory perception of speech, or with the language skills necessary to become competent readers. (Kelly & Barac-Cikoha, 2007). Counseling and AR are the domains in which audiologists can distinguish themselves from other providers. (ASHA Leader, Oct 2016). Audiologists must gather data, advocate for effective communication, and continually educate staff/parents.

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Example Report Language:

“Tim has a hearing loss that, even with hearing aids, limits his comprehension of speech beyond 3-6 feet, especially if any noise is present.

In simulated classroom listening conditions, he was able to repeat 76% of sentences spoken in quiet at a soft speech loudness typical of listening in the classroom at a distance. When a typical level of noise was introduced, this functional listening ability decreased to 64%. This auditory access issue limits his ability to process classroom interactions which is further demonstrated by his inability to discriminate/perceive the speech sounds s, f, th, p, t, k and h from a distance greater than 3 feet in quiet or noise.

These auditory limitations can be improved by use FM hearing technology, but Tim’s education will continue to be adversely affected in any formal or informal discussions with peers, thus limiting his full participation in the classroom.

ADA requires that schools ensure that students with hearing loss are able to communicate as effectively as class peers. In Tim’s case, equal access requires provision of not only FM hearing technology, but also teacher accommodations and skill building in areas including communication repair, self-advocacy and amplification independence if he is to participate and comprehend as fully as possible in order to benefit appropriately from the general curriculum. This includes ensuring that hearing technology is functioning appropriately and, in the case of FM, being used properly, which typically requires daily hearing technology monitoring.

Unmet auditory access issues are likely to result in an increasing academic gap and/or behavioral issues due to frustration secondary to lack of access to verbal instruction and peer communication.”

Supporting Success for Children with Hearing Loss – Information and Resource Topic Areas

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Improving Family Buy-in that the Hearing Loss is Real – from the Start

Counseling is a professional relationship that empowers individuals/families to accomplish their development, education, mental health...goals.

After breaking the news that their child has a hearing loss.....
Provide information that they want to know
When they want/need it (even repeatedly)
In a way that they can understand how it affects their life/their child’s life/future

1. Allow the family to ‘tell their story’
2. Set the stage with a sound bite. Include 6 bits of information:
   a. Screening hearing in newborns is so important that it now happens to almost every baby in the US.
   b. It is important to screen hearing early because of brain development –connections are being created NOW for babies brains to make sense of sound.
   c. Babies need to hear words clearly to learn to understand words and use words on time (1 yr).
   d. It takes 20,000 hours of listening before a young child’s brain is ready to learn to read (5-6 yrs).
   e. Even a small amount of hearing loss will impact brain development and when a child starts to talk or readiness to learn to read.
   f. We need to find hearing loss early so learning problems can be prevented as much as possible
3. Encourage the parents to be at your side during evaluation. Tell them what you are looking for. Check in with them about what they are observing too. Ideally, the diagnosis will be made together.
4. Pause and empower. Do NOT launch into a description of results. Wait.... Maintain eye contact and a concerned look on your face or look down. If about 30 seconds go by you can ask, “How can I be helpful to you right now?” or “This is hard news. What would you like to know first?” And pause. Any words you say now are wasted. Wait until the parent tells you what they want to know.

The power of the PAUSE. It allows parents time to process and the opportunity to say or ask more questions. Give information WHEN they are ready for it. Allow them to process the information both emotionally and rationally. Doing so will help them come to their own conclusions and be ready to move to the next step. Affirm that this is a challenging time for them. Recognize the challenges and how you admire them for taking steps, even as they continue to struggle with the thought of having a child with hearing loss.

You are BUILDING A RELATIONSHIP. The time taken in the first two appointments sets the tone for your relationship -if they will ever return. Parents need to learn that they can rely on you for patience, emotional support and for information. They need to know that you have faith in their ability to make good decisions about their child.

Counseling as a Focused Process
1. Help patients tell their stories (not just at diagnosis!)
2. Help patients clarify their problems (concern areas, need for additional info)
3. Help patients challenge themselves in solving their problems (Goals for child? How to get there? So next steps are...?)
4. Help patients set goals (if we really want Tommy to talk and be ready for school with other kids his age he needs to hear his best NOW... and we need to know how to help him)
5. Help patients develop an action plan (so the first step in hearing his best is....)
6. Help them get data to evaluate progress (i.e., Early Listening Function Checklist (ELF), Auditory Development Checklist, monitoring speech production and language development, etc.).