Red Flags: Barriers to Optimal Auditory Development, Part 2
April 22, 2013

Jane R. Madell, PhD
Sylvia Rotfleisch, MSc
Joan Hewitt, AuD

Introduction
Cochlear Americas’ Commitment to Educational Outreach
Our Presenters

Jane Madell, Ph.D.
CCC-A/SLP, LSLS Cert. AVT

Joan Hewitt, AuD, CCC-A

Sylvia Rotfleisch, MSc

RED FLAGS:
Barriers to optimal auditory development
Part 2

HOPE
22 April 2013

Jane R. Madell, PhD
Jane@JaneMadell.com

Sylvia Rotfleisch, MSc
sylvia@hear2talk.com

Joan Hewitt, AuD
jhewitt@projecttalk.org
THIS IS A TWO PART WORKSHOP

• Part 1 discusses audiology issues
• Part 2 discusses speech-language issues
• Ideally the course should be one two-hour course
• We recommend that attendees view both courses

GETTING STARTED

• Things are fine for most kids
• Why are some kids superstars and other kids not?
• Why the huge variation among kids who seem to be equal?
• We know that not all kids do equally well, but why?
LOOKING FOR EXPLANATIONS

• Some things are clearly a problem:
  – Not hearing well with technology
  – Not getting appropriate therapy
  – Parents not involved
  – Developmental issues
  – Other

• BUT sometimes everything is lined up and kids are still not achieving what we would expect

WHY AUDITION IS IMPORTANT?
WHY IS LISTENING CRITICAL?

• Hearing is the most efficient way to develop spoken communication and literacy
• Hearing = auditory brain development
• It is not really about the ears – it is about the brain!
• Technology is really a brain access tool
• Acoustic access to intelligible speech is critical for development of the auditory brain
  – The auditory cortex is involved in speech perception and language processing in humans

WHAT DO WE NEED TO MAKE IT WORK?

• Early identification and early fitting of technology
• Appropriate auditory access with technology
  – Consistent use of technology every waking hour
    • Typically hearing children have access to sound 24 hours/day
    • If a child wears technology 4 hours/day, it will take 6 years for that child to hear what it takes a typically hearing child to hear in 1 year
    • Until technology is appropriately fit, auditory learning cannot take place
  – Consistent auditory stimulation
  – Ability to hear soft speech
• Auditory therapy with family involvement
Appropriate Technology + Appropriate Auditory Exposure = AUDITORY BRAIN DEVELOPMENT

Appropriate Technology + Appropriate Auditory Exposure = AUDITORY BRAIN DEVELOPMENT
Appropriate Technology + Appropriate Auditory Exposure = AUDITORY BRAIN DEVELOPMENT

THE MOST BASIC RED FLAGS
**RED FLAGS: BASIC behavioral observations**

- Child not tolerating technology
  - Child resistant to wearing technology
  - Behavior management issues related to technology
- Behavioral observations
  - No response/poor response to sound
  - Hypersensitive to sound
  - Involuntary eye blinks/facial stimulation when wearing devices

**IF CHILDREN HEAR WELL WITH THEIR TECHNOLOGY, THEY SHOULD WANT IT ALL DAY, EVERY DAY!!**

**RED FLAGS: Parental Concern**

- Parents (or other family members, especially grandparents) are concerned about progress
  - Are they realistic?
  - Parents are novices; if their concerns are valid, a professional should have noticed
INTERVENTIONAL RED FLAGS OR IS THE INTERVENTION APPROPRIATE?

RED FLAGS: Ineffective Intervention

• Child and family are enrolled in therapy which:
  – Involves the child without involvement of the parents and family
  – Does not monitor technology at every session
  – Does not stress the development of audition as the basis of all speech and language
  – Promotes visual language development (lip-reading, sign language)
  – Does not follow a developmental model
**RED FLAGS: Ineffective Intervention - Parents**

- Parents do not know therapy goals and objectives and are unable to follow through at home
- Parents do not know what the child can and cannot hear
- Therapist does not know what the child can and cannot hear
  - Unable to clearly define auditory skills or difficulties
- Therapist can only report “he is doing fine”
  - Unable to clearly describe child’s abilities or difficulties
- Primary focus in therapy is “THE LING SIX SOUNDS”

**How do we address this? Parents**

- PARENTAL COMPONENT IS CRITICAL!!
- Different auditory based therapy model suggested such as Auditory/Verbal Therapy
- Parents need to be involved in the therapy sessions and trained in sessions
- Therapy for 1, 2 or even 3 hours does not replace parental involvement and reinforcement 24/7
Strengths of Auditory-Verbal Intervention

- Focus on audition and spoken language development
- Focus on guidance and coaching for the parent to help their child

How do we address this? Parents

- Parents need to understand and help determine what the child can and cannot hear
- Parent and therapist must work together as a team
- Therapist establishes appropriate goals and incorporates them into the sessions
- Therapist teaches parent the goals and appropriate follow through to reinforce the goals during the week
- Parent provides information to the therapist on observations noted throughout the week
- If only one person can come to therapy, it would be better if it were the parent than the child
  - Parents need to be the teachers

Parents
**RED FLAGS:** Ineffective Intervention – Visual speech

**Vision as primary modality**

- Indications of speech acquisition through vision
  - Visual based errors (nasals/plosives if same place of production)
  - Poor controls of suprasegmentals (elongations, pitch control/breaks, syllabification)
  - Pitch dependent vowels (lip rounding for “oo”, lip spread for “ee”)

**Importance of Audition**

"....audition is the only sense capable of appreciating all aspects of speech ....."

Daniel Ling
How do we address this? Visual speech

Preventing Visual Speech

• Focus on audition and eliminate vision
  – Understand the weakness of vision to access speech
    • What speech features are accessible visually?
  – Understand the strengths of auditory access for speech development

How do we address this? Visual speech

Preventing Visual Speech

• Eliminate exaggerations
  – If it seems unnatural, it is probably going to create a problem
    • What exaggerations would cause issues?
**RED FLAGS: Ineffective Intervention - Audition**

- Child demonstrates poor auditory abilities:
  - Not responding or turning to name
  - “Listening attitude” not evident
  - Poor voice quality
  - Unable to discriminate /identify
    - Suprasegmentals
    - Vowels
    - Familiar phrases based on suprasegmentals and/or key words
    - Consonant features
  - Speech production not improving

**How do we address this? Understand Audition**

- Audition- For Hard of Hearing/Deaf, the *hearing loss* limits access to speech and language; thus, the *hearing loss* creates the delayed speech and language
  - Defined auditory component to therapy
  - Auditory skill development in appropriate sequence must be the focus of therapy
  - Auditory abilities are developed through the auditory modality
How do we address this? Understand Audition

- Establish Auditory Goals
  - Appropriate sequence-know progression of audition
  - Appropriate level of difficulty
  - Continue to progress through sequence
  - Incorporate in every activity in every session
  - Provide guidance and coaching to parents so they can follow through all week in all settings

How do we address this? Demand Audition

Establish Auditory as Primary Sense Modality

- Set the child (and parent) up for Success
- Physical arrangement of furniture/room
  - How should you be seated to enhance audition?
- Strategies for enhancing focus on audition
  - Joint attention
  - Listening is critical
- Acoustic highlighting techniques
  - Whispering
  - Suprasegmentals (caregiver ease)
  - Elongations at phonetic level and reinforced at phonologic
### How do we address this? Demand Audition

Establish Audition as Primary Sense Modality

- Present signal through *audition* first
  - 3 act play
  - “auditory sandwich”
- Improve auditory access coupled with technology
  - 6 dB rule
- Set up the auditory skill for success
  - Begin at the beginning to establish foundation skills
- Enhance perception
  - Don’t correct speech, enhance auditory perception

### How do we address this? Demand Audition

Establish Audition as Primary Sense Modality

- Auditory closure
- Listening as the foundation for communication
  - “I listen to you and then you listen to me”
  - Turn taking has an auditory basis to allow for conversational competence and convention
How do we address this?
Role of Audition and Technology

- Demand for audition and technology across all environments
  - Therapy
  - Home
  - School

SPEECH/LANGUAGE RED FLAGS AND APPROPRIATE EXPECTATIONS
Why is this important?

• Appropriate expectations at appropriate time periods
• All professionals need to be on the same page
• Allows us to determine when it is time for concern

What questions should the interventionist be asking?

• Is the child making appropriate growth?
• Is the intervention demonstrating speech and language development appropriate and based on audition?
• Is the child meeting speech and language expectations?
• Is the child demonstrating red flag behaviors?
What questions should the audiologist be asking?

- Is the child meeting speech and language expectations?
- Is the child making appropriate growth?
- Is the technology allowing the child to meet the expectations?
- Is the technology providing appropriate gain at all frequencies?
- Is the child hearing soft speech and speech in noise?

Expectations for children with hearing loss

- Developmental expectations come from normal development
- Expectations for children with hearing loss:
  - Follow normal developmental patterns
  - Deviations from normal pattern are cause for concern
  - Rate of development may be increased slightly because of age of child receiving technology and therapy intervention
  - One year’s growth in one year’s time
  - Listening age vs. chronological age
Why is this important?

- Parents are novices and rely on professionals for guidance
- Parents do not always feel that the different disciplines expect the same performance
- Parents do not always feel that all disciplines are receptive to their concerns and the concerns of other professionals
- Parents are confused and frustrated when different disciplines have different expectations and levels of concern

Professional Certification

Percentage of Respondents by Certification

<table>
<thead>
<tr>
<th>Certification</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>CCC-A</td>
<td>39%</td>
</tr>
<tr>
<td>SLP</td>
<td>18%</td>
</tr>
<tr>
<td>CED</td>
<td>17%</td>
</tr>
<tr>
<td>LSLS</td>
<td>26%</td>
</tr>
</tbody>
</table>

Professional Experience in Years

- Less than 3 years: 5%
- 3 - 5 years: 9%
- 5 - 10 years: 12%
- Over 10 years: 74%


# of children under 2 years old served in past 3 years

- 1 - 10: 10.9%
- 11 - 20: 7.1%
- 21 - 30: 10.2%
- 31 - 50: 16.9%
- Over 50: 54.9%

Nature of Caseload

- Primarily age 0-3: 19.7%
- Primarily age 3-6: 9.3%
- Primarily age 6 and above: 14.5%
- All of the above: 56.4%


Are expectations across disciplines similar or different?

- The survey included:
  - Audiologists
  - SLPs
  - LSLS
  - CED/ Teachers of the Deaf

- The survey showed a definite trend for LSLS and SLPs to expect a number of skills to develop earlier than audiologists and CEDs did
Trends Noted in Differences between Certifications

• For a baby with HAs, differences in expectations were noted more in the easier skill levels
• For a baby with CIs, differences in expectations were noted more in the higher skill levels
• Some differences were borderline or not significantly different, but still indicated a trend for LSLS and SLPs to have expectations for earlier development

For a baby with HAs, LSLS and SLPs consistently expected skills earlier (higher expectations) than CED and CCC-A

• Skills consistently expected earlier:
  – Consistently discriminate the suprasegmental aspects of speech
  – Discriminate a nasal consonant from a plosive consonant
  – Discriminate a fricative consonant from a nasal or plosive consonant
  – Produce at least one nasal consonant
  – Produce at least one plosive consonant
  – Accurately produce/babble at least 4 consonants (w, m, n, b, d)
  – Show consistent comprehension of 5 words
  – Show consistent comprehension of 2-3 stereotypic phrases
SURVEY REPORT: Question

• If a baby is aided before 3 months of age and has adequate access to speech and language through the hearing aids, after what period of time with amplification do you expect the child to consistently demonstrate the following skills?
• If a baby is implanted at approximately 12 months of age and received little to no benefit from hearing aid amplification before implantation (developed little to no speech, language or listening skills) after what period of time with the implant(s) do you expect the child to consistently demonstrate the following skills?

SURVEY REPORT

• Assumption that interventionists (LSLS and SLPs) would have the most appropriate expectations since they are working on a regular basis with the children
• Expectations based on results for LSLS and SLPs
  – LSLS group includes dual/multiply certified professionals including SLPs, CCC-A, CED
• There were no significant correlations between years of experience and ratings of skills acquisition. This may be because those without much experience did not answer these questions
  – All SLPs and LSLS were included
SURVEY REPORT: Responds to Name

Expectations of Skill Development

Expectations of Skill Development

SUPPORT FROM CURRENT RESEARCH:

“At 3 months post, [the children] have vowel discrimination for 3 point vowels a/u/i and do place and voicing discrimination -- we don't know that they can do all of them -- but they can do at least one.”

—Christine Yoshinaga-Itano
SPEECH/LANGUAGE RED FLAGS OR IF INTERVENTION IS APPROPRIATE, WHAT PROBLEMS INDICATE IT’S TIME FOR ADDITIONAL HELP?

**RED FLAGS: Speech Production**

- Poor voice quality
  - Gravelly
  - Intensity - whispers or too loud or unable to produce whisper
  - Poor oral nasal balance
  - Poor pitch control
  - Vocalizations on inhale
RED FLAGS: Speech Production

• Poor syllabification
• Poor vowel recognition
• Vowel development, but no consonant development
• Issues of concern regarding consonant development
  • Inappropriate/unusual consonant development
    – Primarily low frequency sounds with CIs, or high frequency sounds with HAs
    – Nasal emissions
    – Lateral fricatives
  • Limited variety of manners of production

RED FLAGS: Speech Production

• Issues of concern regarding consonant development continued
  • Limited variety of place of production
    – Primarily alveolar or bilabial consonants
  • Sequence of sound development inappropriate
    – Developing more advanced phonemes but gaps in skills (e.g. missing G/K only, no bilabials)
    – Voiced sounds, but no unvoiced sounds
    – Unable to elicit specific speech features (bilabial place)
**RED FLAGS: Language Development**

- Lack of development of “conversational” babbling/jargoning
- Babbling/jargoning, but no intelligible vocabulary or language development
- Receptive language development, but no parallel development of expressive abilities

**RED FLAGS: Deterioration of Skills**

- Speech discrimination deteriorates
  - No longer demonstrates perception, discrimination or comprehension previously observed
- Speech production deteriorates
  - Unable to produce a phoneme previously mastered or emerging
- Vocabulary and language development plateau or regression
NEVER ASSUME!!!!

• ALWAYS COLLECT DATA!!!
• You must **test** to begin to determine what is affecting progress
• Your data and documented observations are essential to appropriate remediation of the problems

TAKE HOME POINTS FOR INTERVENTIONISTS

• Express concerns respectfully to your colleagues by providing specific and data
• Examine your intervention to determine if it contributes to areas of concern noted
• Listen to parents
  – Parents are often hesitant to express concerns
  – So, if parents express realistic concerns, we need to take them seriously
• Listen to the kids
  – Production errors are frequently perception errors
• Assess the kids regularly informally and formally to monitor appropriateness of skill development
**SUMMARY**

- Different professionals do have differing viewpoints about developmental expectations
- If professionals have differing expectations, collaboration is affected
- If one professional has lower expectations, s/he will not likely be motivated to change what she/he is doing
- When professionals differ, parents are put in a difficult position because they do not know whom to trust
- Resolution of legitimate concerns and ultimately a child’s progress can be affected by professionals with differing viewpoints

**WE NEED PROFESSIONALS WHO:**

- Like kids
- Can keep the child motivated and engaged
- Think outside the box
- Are willing and motivated to learn
- Are willing and able to modify as needed as we learn more about the child
- Investigate their observations and collect data
- Realize that no one person has all the answers
- Seek and encourage collaboration
- Look for solutions, not excuses
- Always act in the best interest of the child
# REVIEW OF KEY POINTS

- *LISTEN TO THE KIDS*
- Monitor everything
- If progress is not optimal, *INVESTIGATE TECHNOLOGY FIRST*
- Monitor technology and change as needed
- Monitor therapy and change as needed
- Be sure parents and kids are involved in monitoring and in making changes

---

# TAKE AWAY MESSAGE

- It takes a team to raise a child with hearing loss!
- This field is constantly changing
- The population is changing
- The technology is changing
- We all need to change with it
- Because the kids are depending on us!
<table>
<thead>
<tr>
<th>PLEASE WATCH PART 1 FOR MORE INFORMATION</th>
</tr>
</thead>
<tbody>
<tr>
<td>THANK YOU</td>
</tr>
<tr>
<td>Questions?</td>
</tr>
</tbody>
</table>
Contact Cochlear Americas

For inquiries and comments regarding HOPE programming, please contact:

hope@cochlear.com

A Certificate of Participation is available for download from the Handout feature in the lower left-hand portion of your screen.