Learning to Listen with Hearing Technologies: An interdisciplinary perspective on aural rehabilitation

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Learning to Listen as a Child: Aural (Re)habilitation

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Objective

- Discuss the variety of audiological options available for individuals who have hearing loss, whether the hearing loss is mild, profound, unilateral or bilateral.
- Discuss resources for evaluation and intervention of children and adults with hearing loss who are learning to listen with hearing technologies.
- Discuss key principals in evaluation and intervention for children with hearing loss who are learning to listen and use spoken language, whether an infant starting an IFSP or an elementary-aged child who has nearly met all IEP goals.
What is Aural (Re)Habilitation?

• Ongoing assessment and intervention provided by a speech-language pathologist knowledgeable in the listening and spoken language development of children with hearing loss

• Process of guiding a child and family through auditory development stages
What is “LSLS Cert AVT”?

- Listening and Spoken Language Specialization (LSLS)
  - AG Bell Association
  - Demonstrate mastery of nine domains of knowledge
  - Mentorship component
  - Complete 900+ hours of intervention with children with hearing loss who are learning listening and spoken language
  - Movement towards specialty recognition
What is a “LSLS Cert AVT”?  

- Certification  
  - Auditory-Verbal Therapist  
  - Auditory-Verbal Educator  
- Auditory Verbal Therapy promotes  
  - Early diagnosis  
  - Aggressive audiolologic management  
  - Ongoing assessment  
  - One-on-one therapy  
  - Coaching parents as primary facilitators of child’s listening and spoken language development  
  - Supported mainstream education
Rates of Hearing Loss at Birth

- 3: 1,000 births is a child with hearing loss
- 258 babies in 2012 in MN
  - MN Department of Health
  - Additional children identified in preschool and through kindergarten screenings
- 12,000 babies per year nationally
  - National Institute on Deafness and Other Communication Disorders
In 2010, Minnesota screened 67,934 (97.8%) newborns for hearing loss
*excludes infants that are deceased or whose parent(s) declined screening

793
Did Not Pass
(1.2%)

216
Typical Hearing

112
Hearing Loss

465
Lost to Follow-up
(58.6%)

55
Enrolled Early Intervention

57
Not Enrolled

1458
Never Screened
(2.1%)

But 58.6% were lost to follow-up
Communication Opportunities

- American Sign Language
- Signed English
- Total Communication
- Bilingual/bicultural
- Listening and spoken language (LSL)
Family Choice

- No parent choice is a WRONG choice
- Our job is to ensure it is an informed choice
- If they choose LSL, then what will it take to reach that goal?
Why LSL?

• 90% of children born with hearing loss have two parents who have typical hearing
• 85% of families are choosing listening and spoken language
Is that a good choice?

- Degree of hearing loss is no longer a factor in success with LSL
  - “As a result of newborn hearing screening and early intervention, 90% of children with hearing loss should be going into general education rather than into special education classrooms by kindergarten.”

Flexer & Cole, *Children with Hearing Loss Developing Listening and Talking: Birth to six*
## Factors that Influence Performance

### Child Factors
- Age of Identification
- Age of Implantation
- Age of Intervention
- Other ear performance
- Condition of cochlea
- Implant function
- Child’s disposition/learning style
- Child’s cognitive abilities
- Other disabilities

### Environmental Factors
- Parental involvement
- Language-rich home environment
- Wear time
- Child motivation
- Family motivation
- Intervention team
- School environment
- Communication among care team
Listening and Spoken Language

- Listening with a cochlear implant is not “automatic”
- Listening and Spoken Language Requires:
  1. Collaborative, interdisciplinary team
  2. Strategies to facilitate listening and spoken language development
Collaborative Team: Audiologist

• Pediatric Audiologist
  – Identification of hearing loss
  – Aggressive audiologic management
  – Determine if need for cochlear implantation
  – Follow up and programming
  – FMs or other assistive listening devices
Collaborative Team: SLP

- Aural Rehabilitation Specialist
  - Thorough speech and language evaluations
    - Standardized assessments with typical norms
    - Parent checklists
    - Monthly language samples
    - Ongoing assessment
  - Develop individualized goals
  - Auditory focused interventions
  - Parent coaching for around the clock intervention
- Referrals as necessary
  - Occupational, Physical or Feeding Therapy
Collaborative Team: School Team

- Teacher of the Deaf/Hard of Hearing
- School-based Speech-Language Pathologist
  - Ongoing evaluation of student in noise/quiet
  - Auditory interventions
  - Self-advocacy
  - Pre-teaching and post-teaching
  - Parent coaching
  - Educating mainstream teachers
Collaborative Team: School Team

• Audiologist
  – Fit and troubleshoot FM systems
  – Educate teachers on technology
  – Measure room acoustics
  – Communicate with clinical Audiologists and IEP team
Collaborative Team

Regular communication between parents, Audiologists, DHH teachers and SLPs is **essential** to the success of a child learning to listening and use spoken language.
Case Study: Nanette

- Moderate-to-severe, bilateral sensorineural hearing loss IDed at 3 years
- Progressive hearing loss
- Received hearing aids directly following diagnosis
- Enrolled in Northern Voices for 2 years
- Mainstreamed with her typically hearing peers in kindergarten
- Continued to receive weekly, individualized intervention targeting auditory development and speech skills
- 2 Phonak Naida hearing aids & FM system
Case Study: Nanette

- Concern regarding a plateau with articulation and language in 1st grade
  - Initially used FM only at school, but began to rely on FM in one-on-one conversations
  - Social isolation during noisy classroom times
  - Struggling with math and literacy skills
  - More than usual fatigue

- Completed CELF-4 and compared standard scores to previous year’s

- Plateau (decline?) in growth
Case Study: Nanette

Standard Scores
Total Language Score on the CELF-4

- 2010: 98
- 2011: 85
Case Study: Nanette

- Recalling Sentences Subtest
  - Target Sentence:
    My mother is the nurse who works in the community clinic.
  - Response:
    My mother is the nurse to work in the commun clinic.

- What do we do?!?
Case Study: Nanette before CI

- Hearing Thresholds around 70dB
Case Study: Nanette

- Children need optimal access to sound
- Nanette received a cochlear implant first in the right ear and then in the left
Case Study: Nanette after CI
Case Study: Nanette

- Collaborative Team
  - Mom served as case manager
  - Weekly email updates and discussions with Audiologist, DHH teacher and SLP
  - Notebook to share new vocabulary words amongst providers and family
  - Discharged from outpatient care just after 9th birthday
Case Study: Nanette

• Recording
  – How did she learn this new vocabulary word?
The Listening Language Connection

- 90% of language is learned through incidental learning or overhearing (Flexer, 2008)
  - Incidental learning develops schemas
  - Schemas
    - Context-based, organized scripts, assumes prior knowledge
    - Dentist (schema: smell of fluoride, sound of the polisher/drill, swish and spit, get prize at the end)
The Listening Language Connection

- Children need to be savvy listeners and learners
  - Integrate auditory learning, language, cognitive skills, and social-emotional components of communication
Reminder!

- Listening with a cochlear implant is not “automatic”
- Listening and Spoken Language Requires:
  1. Collaborative, interdisciplinary team
  2. Strategies to facilitate listening and spoken language development
Auditory Learning Strategies

- Prompt “LISTENING”
- Incorporate listening into every day life
- Sound-object associations
- 1:1 Quiet Room
- 1:1 Noisy Room
- Speech Hoop or Hand Cue
- Acoustic Highlighting
- Be aware of Acoustics
- “Pause Time”
More Auditory Learning Strategies

- Keep the Bar High
- Manage expectations
- Whisper to get Attention
- Communication temptations
- Conversational Turn-Taking
- Repetition/Routine
- Teach, Don’t Test”
- Parental Involvement
- Modeling with parents and/or siblings
More Auditory Learning Strategies

• Follow auditory hierarchy
• Role Reversal
• Use SABOTAGE
• Auditory/Sequential Memory
  – Store and recall new information
  – Don’t just clean up. “I need the cow.” “I need the cow and the horse.” “Next, I need the animals that can fly.”
• Auditory Comprehension
  – Synthesize the global meaning of spoken language and relate it to known information
AR Resources & Continuing Education

- The Listening Room
  www.hearingjourney.com
- Cochlear’s HOPE Seminars
  hope.cochlearamericas.com/online-courses
- Med-El Kid’s Corner
  www.Medel.com
- AG Bell - Listening and Spoken Language Knowledge Center
  www.agbell.org
- CASTLE at UNC Chapel Hill
  www.med.unc.edu/earandhearing/castle
- Listening and Spoken Language Graduate Training Program at Utah State University
  lsl.usu.edu
Where are we Going?

- Earlier identification and intervention
- Listening and spoken language specialists
- Tele-intervention for rural areas
- Address challenges in mainstreaming
- Research to develop best practices and use of multiple disciplines
Thank you!

Questions?
Contact Information

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References


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Summary

• “Aural rehabilitation is working with a team to develop the optimum auditory signal so a patient can connect sound to meaning in a social, dynamic context”

- Kristina Blaiser, PhD, CCC-SLP
Bilateral Cochlear Implants

2 is Better than 1
• Children with unilateral HL at 10x greater risk for academic failure.
• Increased insurance coverage
• Simultaneous vs. Sequential
• Research supports:
  • Better localization of sound
  • Better auditory performance in background noise.
  • Increased suprasegmental absorption of language
• Goal is more natural language learning across complex listening environments
Things to Think about…

• Formal Aural Rehabilitation programs can be “cookbooks” for treatment
• Intervention should be aim to create natural language interactions
• Always consider appropriate speech and language milestones when designing individualized goals
• Themes often increase success with language carryover
• Hearing loss does not prevent bilingual language acquisition
Early Intervention

• Early auditory intervention allows young children to attain ‘developmental synchrony’
  – Child is able to master skills when the brain intended
  – Developmentally sequenced
Learning to Listen

• Sound-object associations
  – Helps child recognize that sounds have meaning
  – Highlights different sounds
  – Encourages child to produce different speech sounds
  – Develops turn-taking skills, routines and anticipation
Family and Language Development

• Work with families to help them understand diagnosis from a whole-child perspective
• Empower families to make decisions, advocate for their child, and work with medical/educational teams