Importance of Early Identification and Intervention

Donald M. Goldberg, Ph.D.

Identifying and Managing Pediatric Hearing Loss

October 18, 2013
Donald M. Goldberg, Ph.D., CCC-SLP/A, FAAA, LSLS Cert. AVT

Consultant, Professional Staff
Hearing Implant Program (HIP)
Head and Neck Institute
Cleveland Clinic

Professor, The College of Wooster
Department of Communication

President, AG Bell Association for
Deaf and Hard of Hearing
It's ALL About *Learning to Listen!*
Agenda

● Communication Options / “Communication Opportunities”
● Questions to Ask of ALL Options
● Auditory-Verbal Therapy Principles
● Auditory-Verbal Education Principles
● Audiology: The Foundation of Auditory Teaching
Agenda

● Auditory Teaching Techniques (NOT Auditory Training!)
● Cochlear Implants – Let’s Listen and Talk!
● AG Bell Academy for Listening and Spoken Language
   ◦ LSLS Cert. AVT
   ◦ LSLS Cert. AVEd

Questions/Answers
Auditory-Based Teaching Does **NOT** Merely Mean Putting An Acoustic Hoop In Front of Your Mouth!
Opening Doors: Technology And Communication Options for Children With Hearing Loss

- Your Beautiful Child
- Windows of Opportunity
- Quick Facts
- First Reactions
- Early Intervention
- Where Do I Turn?
- Groups Specializing In Hearing Loss and Deafness

- Breaking the Sound Barrier (Hearing Aids, Cochlear Implants)
- Exploring Communication Options (Auditory-Oral, Auditory-Verbal, Cued Speech, Sign Language)

From the U.S. Department of Education

www.ed.gov/about/offices/list/osers/reports.html

&

www.cdc.gov/ncbddd/ehdi
Communication “Opportunities”

(Benedict, 2009)
Communication Options/Opportunities

- Auditory-Verbal
- Auditory/Oral
- Cued Speech
- Verbotonal
- (Simultaneous Communication)
- Total Communication
- ASL/English Bimodal
- Manual Communication
- MCE/Sign Systems
- ASL (Bi-Bi)
Which communication approach is the “BEST” for MY child?

Adapted from Schuyler & Sowers, 1998
NO decision a parent makes is a “WRONG” decision!
Helen Hulick Beebe

Auditory-Verbal Pioneer
Doreen Pollack
A-V Pioneer
Give back to parents their natural role as their child’s first and most important teacher

(adapted from Pollack, 1970)
Principles of A-V THERAPY Practice

(AG Bell Academy for Listening and Spoken Language, 2009)
Principles of AVT Practice

Above PRINCIPLES were adapted from Pollack (1970)

● An A-V Practice requires **all** 10 principles to be in place.

● “Parents” also includes other caregivers who interact with the child.
Principles of Auditory-Verbal EDUCATION
The Options for “Success”…

Have *never* been more exciting!

**Why?**

- Universal Newborn Hearing Screening
- *Increased survival rates of “at risk” infants*
- *Increased focus on EARLY INTERVENTION & clinical efficacy*
- *Advances in sensory technology, most notably, cochlear implants!*
By using today’s incredible “sensory technology,” even children with severe and profound hearing loss can make use of auditory information to develop spoken language – through listening!
Coach the parent as the primary model for listening and talking
Parent guidance should be an integral part of any EI program, as it is the family members who must learn to provide the child with maximum auditory stimulation and ...
who **model** meaningful verbal communication strategies **throughout** the child’s daily activities.
Cornerstones of A-V Practice

● Early Detection/Early Identification

● Appropriate use of sensory aid/s

● **One-on-one intervention** with **full parent involvement**

● Absence of signs & speechreading training

● Integration with hearing peers

● On-going diagnostic therapy

● Auditory-Verbal & Auditory-Based
Take Home Point …

Parents are the most critical change-agents in the lives of their children – therefore PARENT SUPPORT AND COACHING are critical.
Take Home Point …

Families are choosing Listening and Spoken Language at an unprecedented rate (Beginnings, 2013)
The Sky’s the Limit!

Why?
- Early Identification
- Audiology
- Sensory Technology
- Auditory Learning / Early Intervention
- Professional Certification of LSLS/s
Audiology

The Foundation of Auditory-Based Intervention

&

The KEY to auditory “success”
Let’s talk about HEARING!

- **Pinn**
- **Tympanic Membrane**
- **Semicircular Canals**
- **Cochlea**
- **Hearing Nerve (VIII N)**
Normal Processing
Auditory Brain Development

It’s all about the BRAIN!
The ears are just the way in…
1-3-6 (U.S. Centers for Disease Control & Prevention)

1. Before one Month of Age: 
   *Hearing Screening*

3. Before three Months of Age: 
   *Hearing Evaluation*

6. Before six Months of Age: 
   *Early Intervention*

   www.cdc.gov/ncbddd/ehdi
Audiologic Protocol

- **Use a battery approach:**
  - Auditory Brainstem Response (ABR)
  - Otoacoustic Emissions (OAEs)
  - Auditory Steady State Response (ASSR)
  - Behavioral Observation Audiometry (BOA)
  - Visual Reinforcement Audiometry (VRA)
  - Conditioned Play Audiometry (CPA)
AG Bell Academy

- “Recommended LSLS Protocol for Audiological Assessment & Cochlear Implant Monitoring”
  (AG Bell Academy, 2008)
Audiologic Recommendations

On-site audiology program with the early intervention program

Pediatric Test Assistant
(Birth to age 3-years-old)

Active parent participation

Comprehensive testing protocol
Audiograms

Image from League for the Hard of Hearing
Hearing Technology Worn Throughout the Child’s Waking Hours
(www.almontpool.com/www.poolrafts.com)
Consider Trying:

- www.hearinghenry.com
- www.Silkawear.com
- www.hannaanderson.com
# Audiology Recommendations

Because – **every** dB counts!

<table>
<thead>
<tr>
<th>Unaided Testing</th>
<th>CI/HB Testing</th>
</tr>
</thead>
<tbody>
<tr>
<td>Right Ear</td>
<td>CI-Only</td>
</tr>
<tr>
<td>Left Ear</td>
<td>CI &amp; HA</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Aided Testing</th>
<th>HA-Only (if possible)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Binaural</td>
<td>Bilateral CIs</td>
</tr>
<tr>
<td>Right HA</td>
<td>Both CIs</td>
</tr>
<tr>
<td>Left HA</td>
<td>Right CI-Only</td>
</tr>
<tr>
<td></td>
<td>Left CI-Only</td>
</tr>
</tbody>
</table>
FM/s (IR) – NON-NEGOTIABLE!
Take Home Points …

Early and accurate diagnosis is MOST important;
Appropriate technology that is carefully tested, monitored, and “adjusted” as needed is a hallmark of auditory-based teaching;
AUDIOLOGY is the foundation of auditory-based teaching!
It’s ALL about communication!
Auditory Teaching / Auditory Learning

I avoid the terms “Auditory TRAINING”
Recommendation: Auditory Teaching/Learning
Auditory Teaching Techniques

- Emphasize LISTENING
- “Prompt “Listen”
- 1-on-1 Time
- Parents are Partners
- “Hand Cue”
- Use Acoustic Highlighting
- Integrate speech/auditory learning & language goals
- Use “Pause Time”
- Use Conversational Turn-Taking
- “Role reversal”
- Keep High expectations
Auditory Teaching Techniques

- Pay Attention to Acoustics
- Keep AUDIOLOGIC MANAGEMENT a priority
- Beware of Repetition
- Use “Sabotage”
- Listening Age/Hearing Age

- Use Cognitive-Based Activities
- “Teach Don’t Test”
- “Put It Back Into Hearing”
- Follow an AUDITORY Levels of Functioning
Focus on: **AUDITION**
**FIRST**
**Emphasize**
**LISTENING**!
KEY: Parents as partners and case managers
The “Hand Cue”

The most misunderstood technique in the Auditory-Verbal approach
Hand Cue

Excellent acoustics should always be promoted, therefore, **hand placement is critical**

This practice **encourages listening** versus speechreading

Consider using acoustic “hoop”

Be within “earshot”

Adult covers his/her mouth from time to time, most notably **when the child is looking directly** at the caregiver’s/ clinician’s face

Adult may move his/her hand towards the child, in a nurturing manner, as a **prompt for vocal imitation** or as a **signal for verbal turn taking**

No need to “cover” IF the child is playfully engaged & not looking – ooops!
Technique: Acoustic Highlighting

A technique which **enhances the audibility** of spoken language. Progresses from MORE AUDIBLE to LESS AUDIBLE as a child “learns to listen.”

(Adapted from Daniels, 1970s; Simser, 1994)
Acoustic Highlighting involves whispering, singing, emphasizing syntax, segmental & especially **suprasegmental** information to *enhance the audibility of spoken language.*
Pay Attention to Acoustics

- Positioning in therapy lessons
- Use of FM systems
- Use Acoustic modifications
- Know your “speech acoustics”
Keep in mind the need for: Aggressive audiologic management
Take Home Point …

Throughout the day, auditory-based teaching tips are completely “do-able” and reflect good spoken language input and high expectations for “talking.”
Major technique:
There is a range of “Levels of Auditory Functioning”
An Auditory “Hierarchy” *
How Far We Have Come!
(Boothroyd, 1978; Erber, 1982, 2011)

<table>
<thead>
<tr>
<th>Comprehension:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Is there meaning to this sound?</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Recognition/Identification:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Is this sound distinct from other sounds?</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Discrimination:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Is this sound different from other sounds?</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Detection:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Was there a sound?</td>
</tr>
</tbody>
</table>
Auditory Levels

- **Detection**—to indicate the presence/absence of sound
  (Alarm Clock / Wake-Up / Marching Games)
- **Auditory Attention**—to pay attention to auditory signals, especially speech, for an extended time.
- **Identification**—to indicate an understanding of what has been labeled or named or to label or name something.
  (L to L Sounds // Recognition / Identification)
Auditory Levels

- **Auditory Memory / Sequential Memory** – to store and recall auditory stimuli or different length or number in exact order.
- **Distance Hearing** – to attend to sounds at a distance. (FM Issue)
- **Localization** – to localize the source of sound. (Bird Call Localization)
Auditory Levels

- **Auditory Figure Ground** – to identify a primary speaker from a background of noise.
- **Auditory Tracking** – to follow along in the text of a book as it is read aloud by someone else or in conversation.
  (see De Filippo & Scott, 1978)
- **Auditory Understanding / Auditory Comprehension** – to synthesize the global meaning of spoken language and to relate it to known information.
“Putting It ALL Together”

Bathe the child in “rich” language models through talking and having the expectation that the child will be listening!
Integration of Cochlear Implants &/or Hearing Aids and Auditory Intervention
A “Perfect” Marriage
Communication Assessment:

Speech
Speech Intelligibility
Receptive Language
Expressive Language
Auditory Functioning
Assessment of Auditory Functioning
Ling Six (Seven) Sound Test

Consider “NO SOUND” as the 7th Sound

ah (/a/)
oo (/u/)
ee (/i/)
sh
s
m

(Rosemarie Drous, Formerly of the Helen Beebe Speech & Hearing Center)

(Ling & Ling, 1978)
Ling Sounds – Low, Mid, High

/u/ and /m/
/a/ and /i/
/”sh”/ and /s/
## Ling Six Sound Test

### Distance for Detection/Identification

<table>
<thead>
<tr>
<th>Sound</th>
<th>1’</th>
<th>3’</th>
<th>6’</th>
<th>9’</th>
<th>12’</th>
</tr>
</thead>
<tbody>
<tr>
<td>/u/</td>
<td>oo</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>/a/</td>
<td>ah</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>/i/</td>
<td>ee</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>/ʃ/</td>
<td>sh</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>/s/</td>
<td>ss</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>/m/</td>
<td>mm</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Early Speech Perception (ESP) (Moog & Geers, 1990)

<table>
<thead>
<tr>
<th>shoe</th>
<th>cookie</th>
</tr>
</thead>
<tbody>
<tr>
<td>bathtub</td>
<td>hotdog</td>
</tr>
<tr>
<td>toothbrush</td>
<td>sandwich</td>
</tr>
<tr>
<td>ball</td>
<td>baby</td>
</tr>
<tr>
<td>fish</td>
<td>apple</td>
</tr>
<tr>
<td>lunchbox</td>
<td>airplane</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>bed</th>
<th>belt</th>
</tr>
</thead>
<tbody>
<tr>
<td>bus</td>
<td>book</td>
</tr>
<tr>
<td>box</td>
<td>boot</td>
</tr>
<tr>
<td>boat</td>
<td>bat</td>
</tr>
<tr>
<td>bike</td>
<td>bird</td>
</tr>
<tr>
<td>bee</td>
<td>ball</td>
</tr>
</tbody>
</table>

Central Institute for the Deaf © 1990
Auditory Assessment

- Infant-Toddler Meaningful Auditory Integration Scale (IT-MAIS)
  Zimmerman-Phillips, Osberger & Robbins, 1997
- Meaningful Auditory Integration Scale (MAIS)
  Robbins, Renshaw, & Berry, 1991
Infant-Toddler Meaningful Auditory Integration Scale


Available from Advanced Bionics

10 Questions

0-4 Rating Scale

(0=Never; 1=Rarely; 2=Occasionally; 3= Frequently; 4=Always)
Parents’ Evaluation of Aural/Oral Performance of Children
Ching & Hill, 2007

11 Peach Items (6 Quiet; 5 Noise)
Frequency Ratings (n=5) of Reported Behavior
(Never/Seldom/Sometimes/Often/Always)
(0%, 25%, 50%, 75%, >75%)
Take Home Point …

Audiology testing is MORE than getting an audiogram – it must include speech perception and speech audiometry measures as well.
New World Outcomes

Some of our kiddos “test” *at or even above* their Chronological Age!
A “Sweet” Lesson

- A Roll of Lifesavers
- A Box of Dots
“It Happens At Home”

“Natural Language Teaching”

Bathe the youngster in “meaningful” spoken language

“Teaching with a shoelace”

- Let’s make toast
- Bath Time
Data Collection

• “Interventionists” should be keeping data.
• What outcomes are being measured/monitored?
• Both “informal” and “formal” measurements are needed.

Measure/Monitor:

• LISTENING SKILLS / AUDITORY DEVELOPMENT
• SPEECH SOUND REPETOIRE / SPEECH INTELLIGIBILITY
• RECEPTIVE LANGUAGE / COMPREHENSION
• EXPRESSIVE LANGUAGE
Are We On Course?

- Overall – What is the Auditory-Speech-Language Progress?

- Some other specifics:
  - Wear time of CI/s?
  - Progression through auditory hierarchy (basic awareness of sound to Ling Sound detection to Ling Sound recognition/identification, Learning to Listen sound associations, etc.)?
  - Increases and changes in speech sound production?
  - Receptive/Expressive language growth?
Are We On Course?

Typical Benchmarks:

- “Flat” serial audiograms in the “mild” hearing loss range
- Improving speech perception measures (closed to open set; quiet to noise)
- Closing the auditory-speech-language “gap”
- Approximately 1 years growth in 1 years time

See Loud & Clear! – “Clinical Red Flags”
Amy McConkey Robbins (2005)
Alexander Graham Bell Association
for the Deaf and Hard of Hearing

3417 Volta Place, NW
Washington, DC  20007-2778
(202) 337-5220 (V/TT)
(800) HEAR-KID
(202) 337-8314 (FAX)
www.agbell.org  info@agbell.org
What You Might Already Know:

- **AG Bell** advocates Independence Through Listening & Spoken Language Communication
- Professional and Patient/Family Membership
- Based in Georgetown/DC
- Publishes *The Volta Review & Volta Voices*
- Biennial Convention
- Off-Year LSL Symposium
- Advocates: JCIH, CED, & in various Education/Healthcare Arenas
AG Bell Academy

Certification is now available from the AG Bell Academy for Listening and Spoken Language Specialists (LSLS)

- Cert. Auditory-Verbal Therapy (Cert. AVT)
- Cert. Auditory-Verbal Education (Cert. AVEd)
ESSENTIAL KNOWLEDGE AREAS OF A LISTENING AND SPOKEN LANGUAGE SPECIALIST

- Auditory Functioning: 16%
- Spoken Language Communication: 16%
- Parent Guidance, Education, and Support: 13%
- Child Development: 9%
- Spoken Language Development: 18%
- Auditory Functioning and Spoken Language Development: 16%
- Hearing and Hearing Technology: 12%
- History, Philosophy, and Professional Issues: 4%
- Education: 6%
- Emergent Literacy: 6%
We have a “crisis of capacity”

A global saturation of professionals is desperately needed for those families who choose listening and spoken language to communicate.
Take Home Point …

Many more “Qualified” professionals are needed today and most definitely – tomorrow!
Questions, comments? www.ListeningandSpokenLanguage.org
Go to ...

www.
listeningandspokenlanguage.org
A Final Take Home Point …

The “sky is the limit” for our children…
goldbed@ccf.org

dgoldberg@wooster.edu