TOOLS for SCHOOLS™ Program

Advanced Bionics

Setting Appropriate Expectations and Communication Goals with a Cochlear Implant

Name
Title

Mission

At Advanced Bionics we are *dedicated* to improving lives by developing technologies and services that help our recipients achieve their full potential.

- Our commitment to putting patients first and providing the best possible hearing *performance* remains at the forefront of all that we do.

- The trust patients place in us inspires us to act with *integrity and transparency* as we strive for excellence each and every day in all that we do.

To learn more about Advanced Bionics visit AdvancedBionics.com

Advanced Bionics

PHONAK | Partners for Better Hearing

Tools for Schools

Today's presentation is just one of many valuable FREE resources provided by Advanced Bionics' Tools for Schools™ program (TFS™).

The goal of the TFS program is to:

- Help school aged children with cochlear implants succeed in the classroom.
- Ease your workload and save you time.
- Educate parents and professionals about CI technology.
- Provide support for effective teaming between the School, CI center and Home.

Visit www.advancedbionics./tfs to learn more.

Common Expectations after Cochlear Implantation (CI)

- Improved hearing detection thresholds
- Improved speech intelligibility
- Use of spoken language as the primary mode of communication
- Improved language skills
- Improved reading skills
- Potential for mainstream education with normal-hearing children

What you will learn today

- Factors that influence performance in children
- Helping a child with a CI reach their full potential

Factors that Influence Performance

- Age at onset of deafness
- Age at time of implantation
- Consistency of device use
- Bilateral/bimodal device use
- Educational environment
- Family support and follow up
- Residual hearing
- Etiology
- Additional Special Needs
- Other Considerations

Factors that Influence Performance

Age at onset of deafness

Pre-lingually deafened children

- lost ability to hear **before** learning to understand & speak a language
- limited experience with sound and oral language
- poorer auditory memory

Post-lingually deafened children

- lost ability to hear **after** learning to understand & speak a language
- greater experience with sound and oral language
- better auditory memory

Factors that Influence Performance

Age at time of implantation

- Younger Children (12 months – 2 years)
  - critical period for learning language
  - bond quicker to the device
  - auditory plasticity
- Older children
  - length of deafness is greater
  - increased risk for non-use

Factors that Influence Performance

Bilateral/Bimodal Device Use

- Improved hearing in noise
- Improved hearing in quiet
- Improved lateralization & localization
- Assurance that the “better listening” ear is captured

Factors that Influence Performance

Consistency of device use

- Every day, all waking hours is critical
- Consistent use contributes to increased performance
- Inconsistent use discourages device bonding and encourages non-use

Factors that Influence Performance

Educational Environment

- Support and maintain the CI
- Educate those involved with the child
- Provision of an optimal auditory environment
  - FM System
  - Classroom acoustics
- Promotes and encourages auditory development

Factors that Influence Performance

Family support and follow-up

- Consistent Follow Up
  - Regular visits to the audiologist
- Equipment Maintenance
  - Provide optimal listening conditions
- Create a Listening Rich Home Environment

Factors that Influence Performance

Previous Auditory Experience

- Length of deafness is shorter
- Better auditory memory for sound
- Auditory nerve survival may be greater
- Residual hearing provides a "bank" of auditory experiences

Factors that Influence Performance

Etiology

Congenital abnormalities
- Mondini malformation

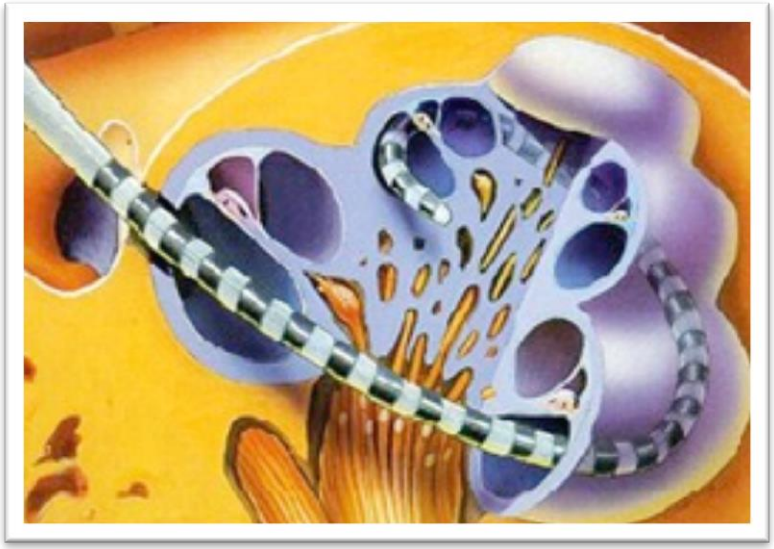
Acquired abnormalities
- Ossification (Meningitis)

Abnormalities in the inner ear may increase the difficulty of the surgery
- May prevent a full insertion of electrode array
- May restrict cochlear implant function

Factors that Influence Performance

Physiology

- Presence of full auditory nerve bundle
- Compromised auditory pathway
- Auditory cortex



Factors that Influence Performance

Additional Special Needs

Cognitive conditions

- Auditory Processing Problems
- Learning Disabilities
- Neurological Problems

Non cognitive conditions

- Blindness
- Cerebral Palsy

Factors that Influence Performance

Considerations for Additional Complex Needs:

- Progress is slower but often still follows that of a child without additional challenges
- Progress is dependent on individual
  - Often requires multi-modality approach to optimize language
- Cochlear implant will not “cure” the other developmental issues
- Multi-disciplinary approach is important

Factors that Influence Performance

Other considerations

- Child's desire for the cochlear implant
- Child's drive to communicate
- Child's behavior

What you will learn today

- Factors that influence CI performance in children.
- **Helping a child with a CI reach their full potential.**

Achieving Full Potential

Create a Plan

- Set Goals and Expectations
- Auditory Integration
- Monitor Progress
- Educate professionals

Setting Goals

What are the goals?

- Language rich environment
- Helping the child to understand what they are hearing
- Helping the child to develop spoken language skills
- Helping the child gain independence and self-confidence

Setting Goals

What is the appropriate Communication Goal?

Fully Visual

Quite Visual

Equally Visual and Auditory

Quite Auditory

Fully Auditory

Setting Goals

- **Use your Experience as Guidance for Setting Goals and Expectations**
  - Educational experience with other children with hearing loss
  - Experience with other children with Cochlear Implants

Setting Goals for Language Development

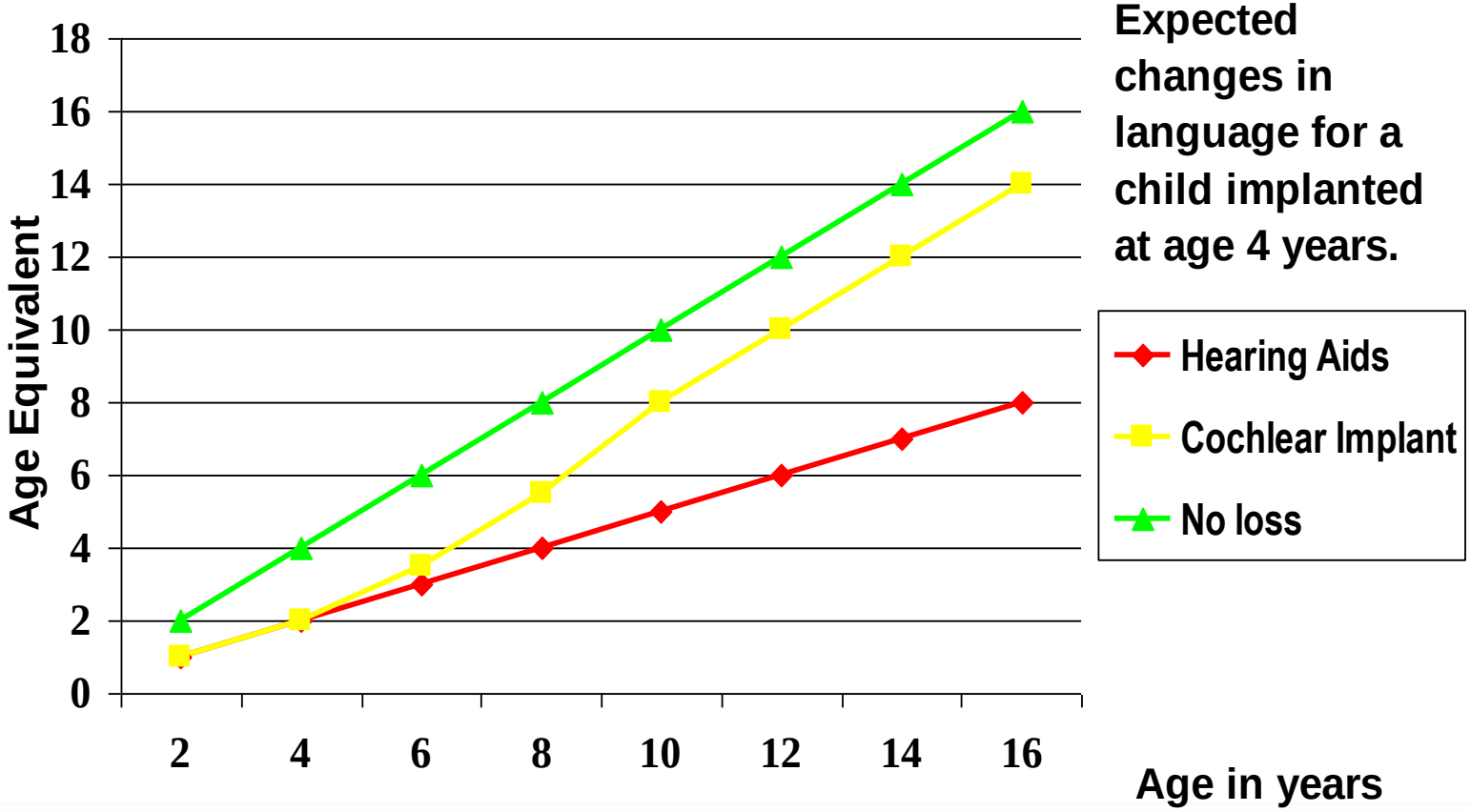
Research has shown:

- After implantation, children should make at least one year of language growth for each year of cochlear implant experience
- Early implantation (prior to age 2 years) may not only prevent increased language delays, but may in fact help to eliminate them
- Children implanted prior to 2 years understand vocabulary and develop language skills faster than later-implanted children
- Communication skills improve significantly with increased cochlear implant use

Kirk, K., Miyamoto, R., Ying, E., Perdew, A., & Zuganelis, H. (2002) Does Age Matter with Cochlear Implants? Cochlear Implantation in Young Children: Effects of Age at Implantation and Communication Mode, *The Volta Review, Volume Number,* Page Range. Retrieved from http://listeningandspokenlanguage.org/Document.aspx?id=455#sthash.59aGjZ5e.dpuf

Setting Goals for Language Development

Rate of Language Growth



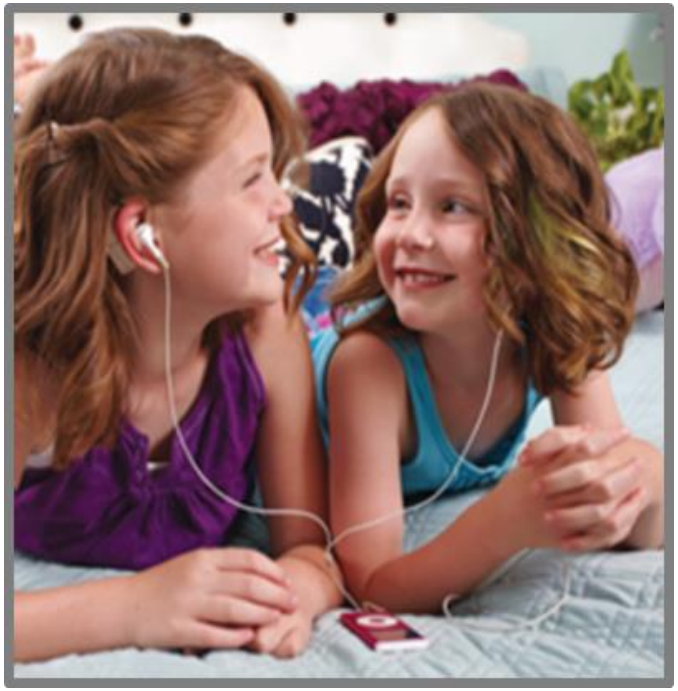
Kirk, K., Miyamoto, R., Ying, E., Perdew, A., & Zuganelis, H. (2002) Does Age Matter with Cochlear Implants? Cochlear Implantation in Young Children: Effects of Age at Implantation and Communication Mode, *The Volta Review, Volume Number,* Page Range. Retrieved from http://listeningandspokenlanguage.org/Document.aspx?id=455#sthash.59aGjZ5e.dpuf

Achieving Full Potential

Create a Plan

- Set Goals and Expectations
- **Auditory Integration**
- Monitor Progress
- Educate professionals

Auditory Integration



Even though the cochlear implant makes sound available to a child's auditory system, the child must be taught to make meaningful use of this auditory information.

Auditory Integration

Components of Auditory Integration

- Consistently communicate that sound has meaning
- Maintain strong expectations for listening
- Reduce predictability
- Participate with student's therapists and parents to bridge activities into the child's real life
- Integrate language goals into auditory classroom activities
- Integrate the process of listening, speaking, and thinking

Auditory Integration

Sound Has Meaning

- Allow time for a child to process what was heard before expecting a response
- Practice using the auditory sandwich by: first, describing concepts or talking about an activity; then, allow time for thinking about what was heard; finally, demonstrate or show, and finish with a spoken statement
- Use prompts, "Did you understand me or are you still thinking?" and encourage asking for clarification
- Encourage commenting on things that the child hears or that others say

Auditory Integration

Strong Expectations for Listening

- Give opportunities for children to self-monitor spoken language through listening
  - After giving directions, ask children to restate the directions for an activity or provide the next step
  - Encourage responding to what a classmate has said
- Use hearing peers as models
- Purposeful sabotage
  - Say one thing and do another and ask for clarification of what was said and what should have been done

Auditory Integration

Reduce Predictability

- Use new vocabulary for the same word/activity (get out your writing instrument vs. pencil)
- Use different speakers (student vs. teacher reading out loud)
- Sabotage a spoken direction used during a common classroom routine (say one thing and do another)
- Change the expected order of events in a schedule to check for listening

Auditory Integration

Bridge Activities

- Collaborate with Parents and Therapists:
  - Share classroom themes/content with parents & therapists for extension listening and language activities at home and during therapy
  - Send vocabulary lists and spelling words to home & therapy
  - Integrate listening and language goals from therapy into classroom
- Use examples from child's daily living to explain new concepts in the classroom
- Help connect new knowledge to life experiences

Auditory Integration

Integrate Goals into the Classroom

- Ask parents and therapists for goals and plan for activities to practice speech, listening, and language goals using classroom content
- Provide frequent opportunities to rehearse concepts/directions presented in the classroom
- Encourage use of metalinguistic strategies in the classroom: self-talk, predicting, paraphrasing, and summarizing
- Invite the Hearing Itinerant teacher to observe and make suggestions for opportunities to integrate listening into the classroom

Auditory Integration

Integrate Listening, Speaking, Thinking

- Model and practice thinking out loud during classroom activities
- Create opportunities to talk about new topics or expand knowledge of known topics
- Take advantage of teachable moments by using incidental learning opportunities to teach language, focus on listening, and increase knowledge of the world
- Explore and learn about new topics through reading, going, doing, and discussing
- Take opportunities to use figures of speech and discuss what is heard and what is meant ("That was a slam dunk!")

Achieving Full Potential

Create a Plan

- Setting Goals and Expectations
- Auditory Integration
- **Monitor Progress**
- Educate professionals

Monitor Progress

Progress should be monitored at regular intervals

-How is child progressing compared to pre-implant performance?

-How is child doing compared to other similar children with cochlear implants?

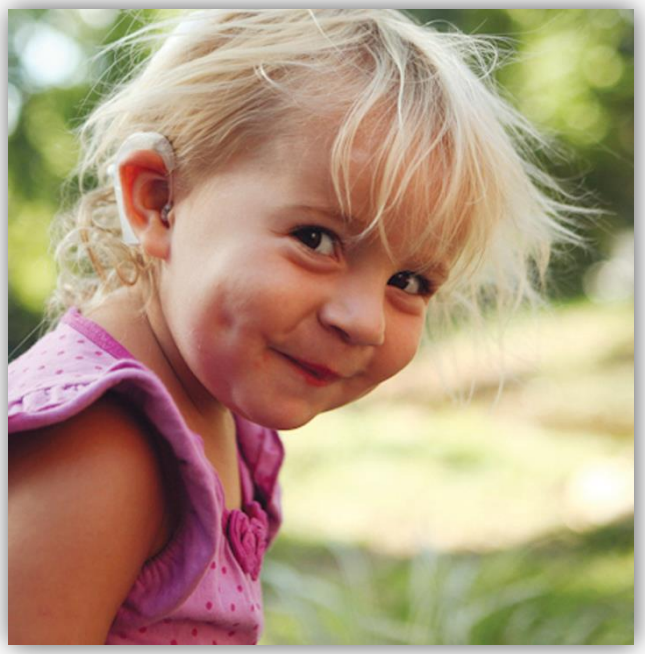
-How is child doing compared to normally hearing peers?

- Is child meeting set goals?

Monitor Progress

How to Monitor Progress

- **Formal Evaluations**
- Auditory Benchmarks
- Red Flags



Monitor Progress

Formal evaluations

- Commonly completed by CI Center
- Assess auditory thresholds
- Assess speech perception abilities
- Assess understanding, use of language, and speech production abilities

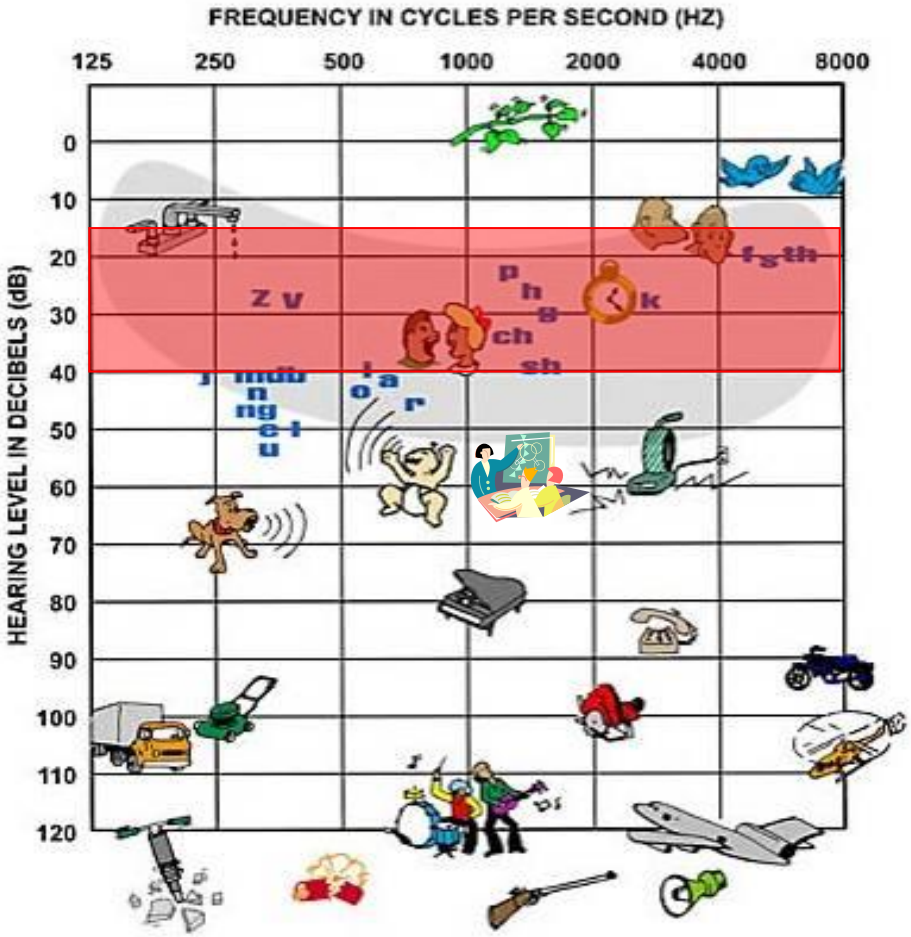
Monitor Progress

Formal Evaluations

Post CI AUDIOGRAM

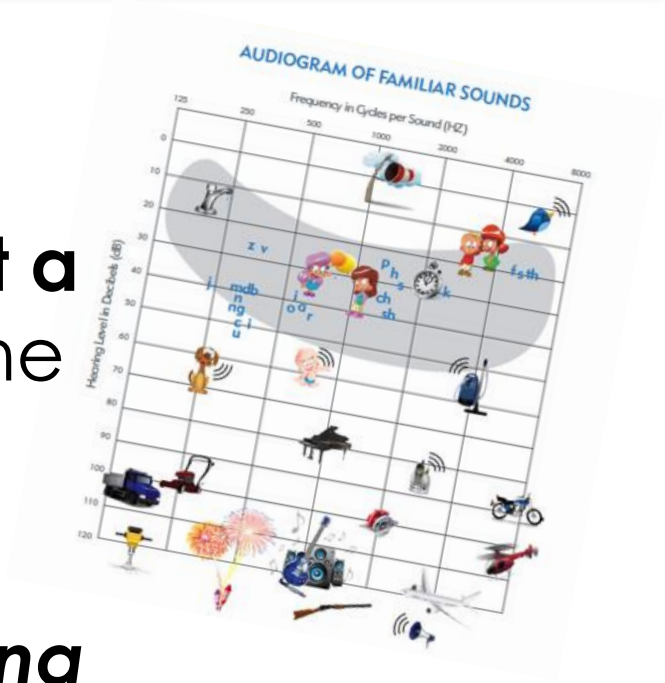
After a few months of experience, most children can detect sound in the normal to mild hearing loss range.

Goals should be set to take advantage of the child's improved sound detection abilities



Monitor Progress

Keep in mind the ability to **detect a sound** confirms audibility along the frequency spectrum but



Audibility does not = understanding

Monitor Progress

Formal Evaluations

Speech Perception Testing

- Provide information on the child's ability to perceive and process auditory messages
- Assess children at different levels of skill development
- Demonstrate progress over time.

Monitor Progress

Speech Perception Tests

Responses during this type of testing:

- Indicates understandability in ***an ideal listening environment***
- Does not indicate "real world" understandability (noise, distance, soft voices)

Monitor Progress

Formal Evaluations

Many centers will complete formal speech and language evaluations to track the child's progress in speech production and language development

Monitor Progress

How to Monitor Progress

- Formal Evaluations
- **Auditory Benchmarks**
- Red Flags

Monitor Progress

Auditory Benchmarks

Auditory Benchmarks for progress have been developed using research results.

- Provides average data to measure progress
- Provides information on variables that can affect progress
- Assists when counseling family and others

Monitor Progress

Auditory Benchmarks

- Pre-implant characteristics predict post CI outcomes

GROUP 1

- Implanted in the preschool years.

GROUP 2

- Implanted at age 5 or later.
- Some residual hearing and speech perception skills.
- Consistent use of hearing aids.
- Communicates primarily through speech.

GROUP 3

- Implanted at age 5 or later.
- Little or no residual hearing or speech perception skills.
- Highly dependent on sign.

McConkey-Robbins, A. (2005). Clinical Red Flags for Slow Progress in Children with Cochlear Implants. *Loud & Clear!, 1,* 1-8.

Monitor Progress

Auditory Benchmarks
Group 1 – Preschool

1 Month	Full time implant use without resistance.
3 Months	Changes noted in vocalizations
6 Months	Spontaneous response to name and common environmental sounds
12 Months	Attaches meaning to sound

Monitor Progress

Auditory Benchmarks
Group 2 – 5 years or older & residual hearing

1 Month	Full time implant use without resistance
3 Months	Closed set understanding of some familiar words
6 Months	•Understands many familiar words in a closed set •Spontaneously alerts to name •Understands some familiar phrases
12 Months	•Spontaneous response to own name vs. others •Auditory recognition of some sounds at school

Monitor Progress

Auditory Benchmarks

Group 3 – 5 years or older & limited or no auditory experience

1 Month	Full time implant use without resistance
3 Months	Discriminates patterns of speech
6 Months	•Understands a few words in closed set •Alerts spontaneously to loud noises •Begins to detect name spontaneously •Reports dead battery some of the time
12 Months	•Understands many words in closed-set •May understand familiar phrases •Knows when device is not working •Spontaneously responds to name about half the time

Monitor Progress

Auditory Benchmarks

Provide:

- Outcomes data for a large number of implant recipients
- Information on "typical performance"

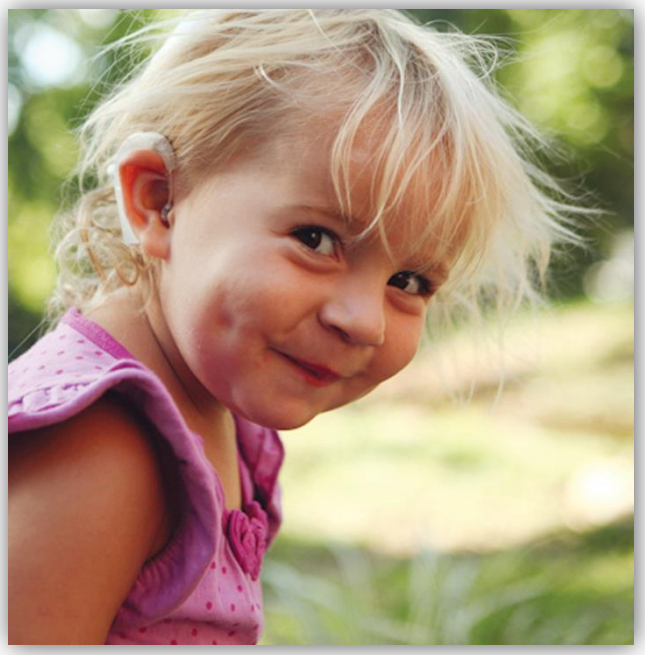
However…

- Outliers are a reality
- Each person brings their own individual hearing health history and personal attributes to the implant experience

Monitor Progress

How to Monitor Progress

- Formal Evaluations
- Auditory Benchmarks
- **Red Flags**



Monitor Progress

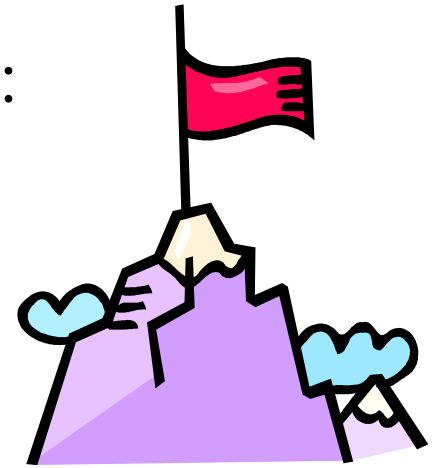
Red Flags

- Set up brief meetings between educators and parents every 3 months the first year after implantation
- Identify "**red**-flags" for children who are not progressing appropriately.

Monitor Progress

What is a red flag?

- Concern that is raised over a child's inadequate progress with a cochlear implant
- Severity of the concern relates to:
  - The length of the delay
  - The number of skills delayed



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Monitor Progress

Examples of Red Flags

- Decrease in speech perception ability
- Decrease in speech production skills
- Sudden resistance to wear the device
- Sudden change in attention or behavior
- Constant "fiddling" with the speech processor
- Lack of progress over a period of time
- Sudden decline in progress documented over several sessions
- **Failure to meet expected goal or auditory benchmark**

Monitor Progress

TOOLS for SCHOOLS™

TRACKING AUDITORY PROGRESS IN CHILDREN WITH COCHLEAR IMPLANTS

By Amy McConkey Robbins, MS, CCC-SLP, LSLS Cert. AVT

What are the auditory benchmarks for average progress in children with cochlear implants (CI) during the first year of implant use?

Auditory benchmarks have been established independently for three groups of children, based upon research findings and clinical experience.[1,2] These groups are:

Group 1: Children implanted in the preschool years (age four or earlier).

Group 2: Children implanted at age five or later who have some residual hearing/speech perception skills, have consistently worn hearing aids, and communicate primarily through speech.

Group 3: Children implanted at age five or later who have little or no residual hearing/speech perception skills and are highly dependent on sign language and other visual cues for language learning.

The benchmarks shown for each of the three groups in Tables 1, 2, and 3 are based on data collected and reported by the investigators cited above.

Tracking Auditory Progress in CI Children

Note: Child is credited only for skills in listening-alone conditions. "Spontaneous" means without prompting or modeling and when not in a listening set.

Time post-implant child should demonstrate the skill

Table 1 — Group 1 • Children implanted at age four years or earlier

Skill	1 mo.	3 mos.	6 mos.	9 mos.	12 mos.
1. Full-time use of CI					
2. Changes in spontaneous vocalizations with CI use					
3. Spontaneously responds to name 25% of time					
4. Spontaneously responds to name 50% of time					
5. Spontaneously alerts to a few environmental sounds					
6. Performance in audio booth consistent with what is reported at home					
7. Evidence of deriving meaning from many speech and environmental sounds					
8. Major improvement in language					

Use this TFS Resource to help you track progress and monitor red flags

Monitor Progress

Responding to Red Flags

TABLE 4: HOW TO RESPOND TO *ONE RAISED RED FLAG*
☑ Share ideas with child's parent
☑ Confirm child wears CI all waking hours
☑ Contact CI Center regarding possible equipment/ programming changes
☑ Assess that home/school environment creates a need for child to use the skill
☑ Verify that prerequisites to a skill are adequately established
☑ Break down skill into smaller steps, and teach those steps
☑ Use different materials/teach the skill in another way
☑ Increase the intensity of training toward the skill
☑ Write plan of action/check every month for three months

TABLE 5: HOW TO RESPOND TO *TWO RAISED RED FLAGS*
☑ Share concern with child's parent
☑ Confirm child wears CI during all waking hours
☑ Contact CI Center regarding equipment/ programming changes
☑ Utilize any 1-flag response
☑ Change in teaching methods/techniques
☑ Add sensory modality
☑ Consult with a colleague for new ideas
☑ Refer for learning profile testing
☑ Refer to specialists to rule out additional disabilities

McConkey-Robbins, A. (2005). Clinical Red Flags for Slow Progress in Children with Cochlear Implants. *Loud & Clear!, 1,* 1-8.

Monitor Progress

For some children Red Flags may indicate

- Lack of consistent device use
- The need for programming changes
- Equipment issues
- The need for a communication environment in which listening and speech are addressed appropriately on a daily basis.

McConkey-Robbins, A. (2005). Clinical Red Flags for Slow Progress in Children with Cochlear Implants. *Loud & Clear!, 1,* 1-8.

Monitor Progress

For some children Red Flags may indicate

- An underlying cognitive issue which makes the child a slower learner
  - A multidisciplinary evaluation may provide valuable information
  - More time may be required at each level of instruction
  - These children should keep moving along the auditory continuum, even if at a slower rate.

McConkey-Robbins, A. (2005). Clinical Red Flags for Slow Progress in Children with Cochlear Implants. *Loud & Clear!, 1,* 1-8.

Monitor Progress

Keep in Mind

- Group performance data only provide guidance for setting expectations
- Your work, ultimately focuses on the individual child
- Each child may represent the exception, not the rule
- Set and maintain expectations that take into account the unique abilities and life circumstances of each child and his or her family
- Be flexible and willing to change goals
- Know when to contact the cochlear implant center
  (Tools for Schools has forms to assist you in communicating with the cochlear implant center)

McConkey-Robbins, A. (2005). Clinical Red Flags for Slow Progress in Children with Cochlear Implants. *Loud & Clear!, 1,* 1-8.

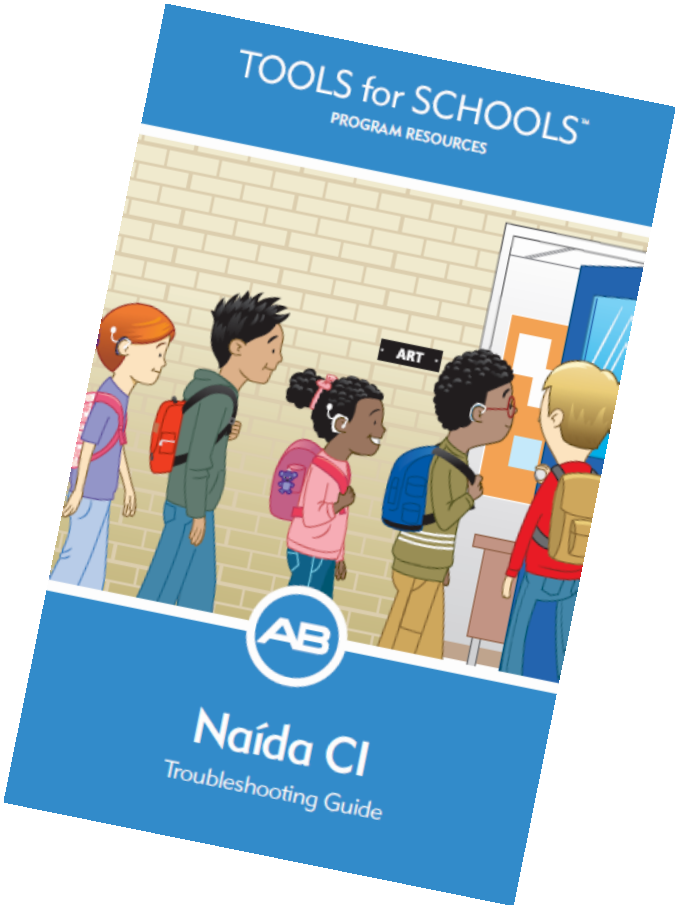
Achieving Full Potential

Create a Plan

- Set Goals and Expectations
- Auditory Integration
- Monitor Progress
- **Professional Education**

Professional Education

- Understand what a cochlear implant is and how it functions
- Understand how to complete troubleshooting
- Know where to find support and resource materials
- Communicate with your student's cochlear implant center



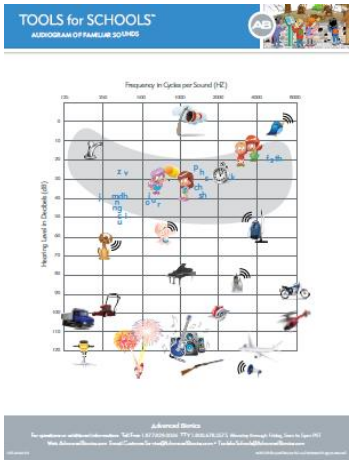
Summary

- Outcomes after cochlear implantation are individual and depend on the many factors that influence performance
- There are many ways to assist children in reaching their full potential with a CI
  - Set appropriate goals and expectations
  - Use Auditory Integration
  - Monitor progress
  - Be aware of red flags
  - Communicate with your team members at school and your CI Center
- Adjust expectations as appropriate
- Educate yourself and other professionals

Her cochlear implants allow her to participate in many different Student Council activities that involve being in social settings. She feels part of a group and not like an outsider. Most importantly her friends and peers see her as Addison, the funny, kind hearted, smart young lady that she is and not the "girl with the bionic ears."

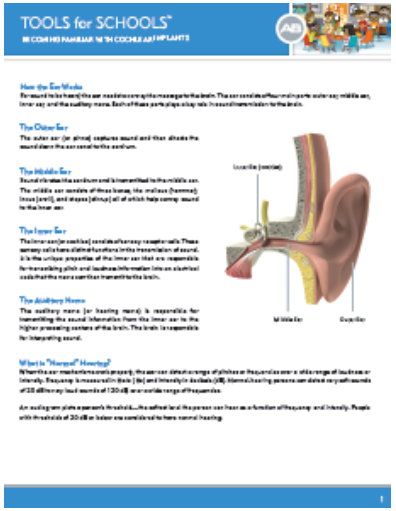
—Rachelle Blackmon, mother of Addison, bilateral AB recipient

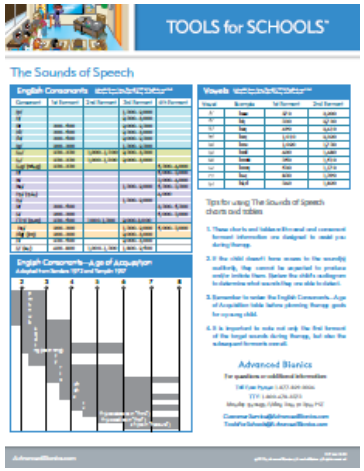
AB Makes it Simple for Schools

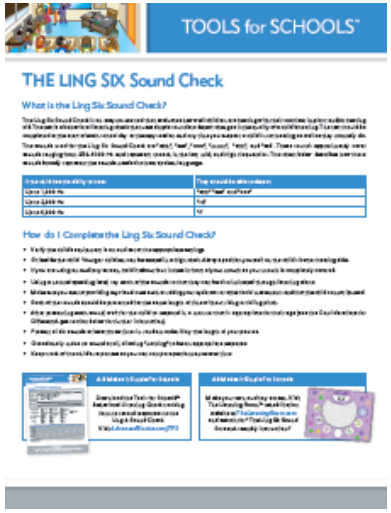


FREE resources!!

www.advancedbionics.com/tfs







Tools for Toddlers ™ Program

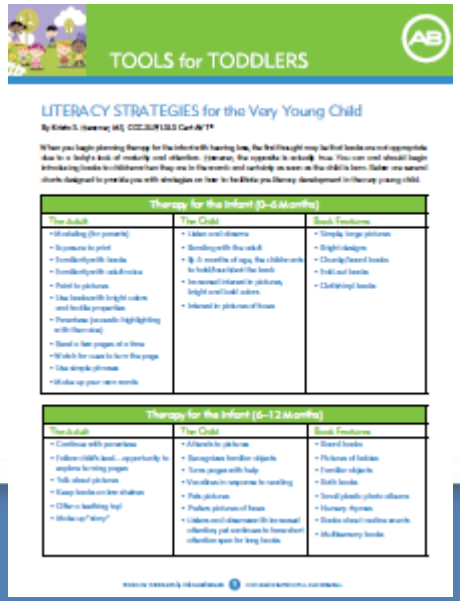
Do you know about Advanced Bionics' Tools for Toddlers program (TFT ™)?

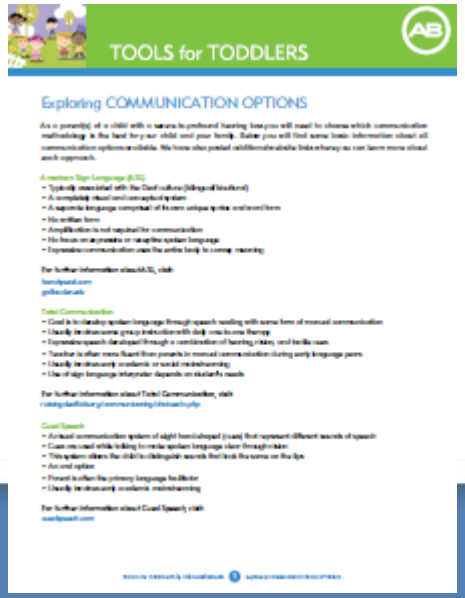
TFT provides free resources created specifically to help support early intervention and pre-school aged children.

Visit the Tools for Toddlers Program at

www.advancedbionics.com/tfs

TFT resources can be found on the lower section of the TFS page





AB Makes It Simple for Schools

Additional FREE Resources

- www.hearingjourney.com
- www.thelisteningroom.com
- www.advancedbionics.com/bea
- www.advancedbioinics.com
  - Take free courses
  - Learn about products
  - Watch videos
  - Download materials and resources
  - Connect with others

bea™ Bionic Ear Association

rehAB AB's global rehabilitation & educational programs

THE Listening Room www.BionicEar.com

HEARINGJOURNEY™

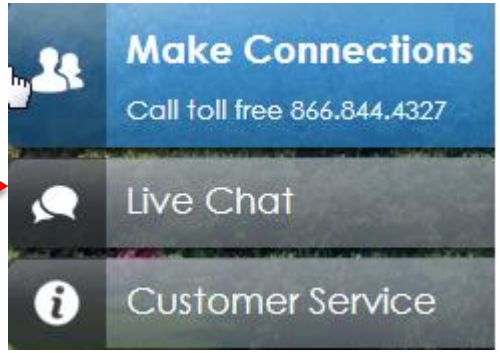
Additional Resources and Support

Customer Care:

Speak with an audiologist:

Toll Free Phone: 1-877-829-0026

TTY: 1-800-678-3575



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