

Children with Cochlear Implants Who Sign: Guidelines for Transitioning to Oral Education or a Mainstream Setting

Introduction

These guidelines are intended to facilitate discussion and decisions by families and professionals regarding appropriate educational settings for children with cochlear implants. Development of these guidelines resulted from roundtable discussions among audiologists, speech-language pathologists, psychologists, and teachers of the deaf who were convened by the Boston Center for Deaf and Hard of Hearing Children and the Cochlear Implant Center of Children's Hospital, Boston, MA. These guidelines were written to address the needs of a growing number of deaf children who receive cochlear implants and who used a visual language system as their primary means of communication at the time of implantation. Private clinicians and representatives from schools for the deaf and mainstream programs throughout New England using auditory/oral, Signing Exact English (SEE-II), sign-supported spoken English, and/or American Sign Language (ASL) collaborated to develop these guidelines.

The ability to communicate and to receive instruction in the language of the proposed classroom is key to determining a student's readiness to enter that setting, with or without additional supports. Some children who receive a cochlear implant use a visual linguistic system (e.g. Sign Language) as their primary means of communication. Students' needs and preferences may change as they learn language in the auditory/oral (listening/speaking) modality. The transition towards learning through an auditory linguistic system may take place through multiple stages and may be a gradual process. Language abilities should be measured both by functional performance and standardized tests. A comparison of functional performance in visual language or combined visual plus aural/oral language is necessary to assess if there is a significant discrepancy in ability between language modalities.

Checklists are provided for two age groups: young children under 5-years of age and students 5-years of age and older. For older students, academic risk factors exist if the student's aural/oral development is discrepant from the level of complexity of spoken English used in the proposed classroom.

Though criteria for success in a mainstream setting typically may be based on speech and audition skills, the student's academic abilities and learning style should also be considered during any transition. Consider the student's ability to understand and express abstract as well as concrete information and also the language and culture of the child's family and community.

Key factors to discuss in determining the appropriateness of a shift from a signing to an oral setting include the level of educational and communicative supports that are needed and are available to the student. Further considerations are included in the appendices – addressing physical accommodations, classroom strategies, and equipment considerations necessary for successful programming in a mainstream or oral educational setting. A glossary of terms is included after the other appendices.

Competencies for Transition from Manual To Oral Instruction The Child With a Cochlear Implant Under 5-Years of Age

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Oral Receptive Language

Evaluate in a quiet setting and with background noise.

| Child.... | Frequently | Sometimes | Never |
|---|--------------------------|--------------------------|--------------------------|
| _ understands connected speech used by adults in the proposed educational setting | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| _ comprehends and follows spoken directions | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| _ understands the language of instructional activities and possesses an oral language base strong enough to learn topics | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| _ consistently accesses and understands real-world information as assessed by appropriate participation in typical preschool activities | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| _ participates in conversation interactions with one peer | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| _ attends to group conversation auditorally | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| _ demonstrates incidental auditory learning | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

Oral Expressive Language

| Child.... | Frequently | Sometimes | Never |
|---|--------------------------|--------------------------|--------------------------|
| _ is understood by familiar adults when speaking | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| _ is understood by peers in routine/predictable events and in social conversations | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| _ is able to express ideas and convey a meaningful message with connected spoken language, including real-world information | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| _ uses and understands pragmatic language (see glossary) | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

Competencies for Transition from Manual To Oral Instruction The Child with a Cochlear Implant Under 5-Years of Age

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How to Use the Checklists in Making Transition Decisions

A majority of checkmarks falling in the "Never" column indicates that the child may not be ready for transition to an oral environment.

A majority of checkmarks falling in the "Sometimes" column indicates that the child has emerging skills toward transition to an oral environment.

A majority of checkmarks falling in the "Frequently" column indicates that the child may be ready for transition to an oral environment.

Note: A child who may be in an oral program or in the mainstream without sign support and who scores primarily in the "Never" range should have placement and support services reviewed.

Additional Considerations

➤ **Language Demands**

Does the child have the ability to respond to direct and indirect language demands in teacher-directed and child-directed activities?

➤ **Social Skills**

Does the child have the ability to interact with peers and the understanding of social and pragmatic cues?

➤ **Self Concept**

What is the child's sense of self and ability to persist on challenging tasks?

See neutral person note in Appendix.

➤ **Additional Disabilities** (cognitive, physical, sensory)

Are there other disabilities that might impact this transition?

➤ **Attending Abilities**

Is the child able to sit and attend during presentations of content material?

➤ **Parent/Guardian Input and Support**

Are there additional language and culture considerations in the home?

Competencies for Transition from Manual To Oral Instruction The Child with a Cochlear Implant, 5-Years of Age and Older

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Oral Receptive Language

Evaluate in a quiet setting and with background noise.

| Child.... | Frequently | Sometimes | Never |
|--|--|--|--|
| _ understands connected speech used by adults in the proposed educational setting | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| _ comprehends and follows spoken directions related to the curriculum | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| _ understands the language of instructional activities and possesses an oral language base strong enough to learn topics in depth | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| _ attends to group conversation auditorally with facilitation by an adult. (Group number should equal typical group size in proposed classroom.) | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| _ attends to group conversations auditorally | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| _ demonstrates incidental auditory learning | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| _ exhibits relative speed in auditory processing of new information comparable to classroom peers | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| _ demonstrates the above receptive skills for spoken language in the following settings: ➤ one-on-one ➤ small group ➤ large group | <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> | <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> | <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> |
| | | | |

Competencies for Transition from Manual To Oral Instruction The Child with a Cochlear Implant, 5-Years of Age and Older

Oral Expressive Language

| Child- | Frequently | Sometimes | Never |
|--|--|--|--|
| _ uses spoken English without sign support | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| _ speech is easily understood by: | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| <ul style="list-style-type: none"> ➤ familiar adults ➤ less familiar adults ➤ peers in academic and social conversations | <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> | <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> | <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> |
| _ uses no more than 2 to 3 repairs/rephrases per conversation with an adult | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| _ carries on a conversation with one peer <ul style="list-style-type: none"> ➤ independently ➤ with assistance of a language facilitator | <input type="checkbox"/> <input type="checkbox"/> | <input type="checkbox"/> <input type="checkbox"/> | <input type="checkbox"/> <input type="checkbox"/> |
| _ participates in group conversation <ul style="list-style-type: none"> ➤ independently ➤ with facilitation by adult <i>Note: Group number should equal the typical group size in the proposed classroom.</i> | <input type="checkbox"/> <input type="checkbox"/> | <input type="checkbox"/> <input type="checkbox"/> | <input type="checkbox"/> <input type="checkbox"/> |
| _ is able to express ideas and convey a meaningful message with connected, spoken language | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

Written Language Skills (Reading and Writing)

| Child- | Frequently | Sometimes | Never |
|--|------------|-----------|-------|
| _ demonstrates reading skills comparable to potential classmates/peers _ demonstrates written skills comparable to potential classmates/peers | | | |

Competencies for Transition from Manual to Oral Instruction The Child with a Cochlear Implant, 5-Years of Age and Older

How to Use the Checklists in Making Transition Decisions

A majority of checkmarks falling in the "Never" column indicates that the child may not be ready for transition to an oral environment.

A majority of checkmarks falling in the "Sometimes" column indicates that the child has emerging skills toward transition to an oral environment.

A majority of checkmarks falling in the "Frequently" column indicates that the child may be ready for transition to an oral environment.

Note: A child who may be in an oral program or in the mainstream without sign support and who scores primarily in the "Never" range should have placement and support services reviewed.

Additional Considerations

➤ **Academic Progress**

Is the child able to maintain appropriate or expected academic progress when transitioning to a new placement?

➤ **Social Skills**

Does the child have the ability to interact with peers and the understanding of social and pragmatic cues?

➤ **Self Concept**

What is the child's sense of self and ability to persist on challenging tasks?

See neutral person note in Appendix.

➤ **Additional Disabilities** (cognitive, physical, sensory)

Are there other disabilities that might impact this transition?

➤ **Attending Abilities**

Is the child able to sit and attend during presentations of content?

➤ **Parent/Guardian Input and Support**

There may be additional language and culture considerations in the home.

APPENDICES

Program Considerations for a Child with a Cochlear Implant in the Oral/Mainstream Classroom

Children who use cochlear implants (as with children who use hearing aids) experience significant difficulty listening and learning in classroom environments with background noise and typical classroom commotion. Consideration of classroom acoustics is crucial. Modifications may be necessary to improve the listening conditions. Additionally, classroom strategies must also be employed to support the child in attending to teacher instruction and learning in a classroom environment. The following lists various accommodations and strategies for meeting the needs of a child who uses a cochlear implant:

PHYSICAL ACCOMODATIONS:

Aggressively manage the acoustics of the learning environment by addressing reverberation (echo), noise reduction and distance to include:

- acoustic tiled ceiling no higher than 10 feet
- carpeting over more than 2/3 of the classroom
- drapes at window walls
- sound absorption panels or acoustic wall covering to reduce reverberation (echo)
- low HVAC noise levels
- monitoring noise from sources such as water fountain, aquarium, and computers
- closing classroom windows and doors to dampen ambient noise
- rubber base guard at the base of door to reduce noise from the hallway
- personal FM system and/or Classroom/Sound field FM system in the classroom to reduce the negative effects of background noise and distance from the teacher during instruction. Be sure to seek recommendations from the child's audiologist.
- good lighting without buzz from fluorescent fixtures

For further information regarding appropriate classroom acoustics refer to the websites below:

- **Classroom Acoustics Coalition:** <http://www.nonoise.org/quietnet/qc/>

This site offers an online version of a booklet called *Classroom Acoustics: A Resource for Creating Learning Environments with Desirable Listening Conditions*.

- **Classroom Acoustics Homepage:** www.classroomacoustics.com

This site offers links to Federal Register Petition for Rulemaking and articles.

Supply the classroom with a portable, audible and visible alarm, hard-wired into the fire alarm system in the hallway. This equipment can be moved from classroom to classroom as a student changes classroom from year to year.

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CLASSROOM STRATEGIES:

Assign a **neutral person** separate from the service delivery team personnel, who will check on the student and monitor the student's adjustment and ability to advocate for self as needed. The neutral person must be a knowledgeable professional with understanding of the range of communication skills, acoustic and technical modifications to facilitate communication, and curriculum expectations.

Maintain a communication notebook between school and home with regular entries from family, teacher(s) and therapist(s) regarding content vocabulary and concepts, stories and books read in class, audition, and language.

Provide parents and speech therapist with an overview of class lessons and list

activities, content vocabulary and concepts, and books on the subject. This allows for preview, review, and carryover of classroom language.

Position the main teaching area away from windows as glare may make lipreading difficult, and away from external background noise (e.g. HVAC vents or hallways).

Close windows and door when there is noise outside the classroom.

Provide preferential seating, keeping in mind which side of the head the implant microphone is located. Position the student, peers and teacher accordingly.

Institute a "One Voice Rule". (Only one person talks at a time in large and small group activities. Other adults in the room do not talk among themselves as the teacher is instructing.)

Use a sound field and/or personal FM system with a boom microphone and a pass around microphone for access to comments/questions from peers in the classroom.

Signal or cue the entire class to listen before instruction or directions are given.

Preview and review content vocabulary and concepts. Spot check the student's comprehension of instruction presented orally by asking the student to repeat a direction, tell what the class will do next, or explain the meaning of a word or concept in a natural manner.

Repeat questions and comments from classmates as well as announcements made over the public address system.

Provide visual supports in the classroom using appropriate visual demonstrations and developmentally age-appropriate written materials. Use "hands-on" experiences to reinforce visual and auditory input.

Post and refer to a schedule (picture or written) as a preview of the day's activities as an alert to a change in the regular routine, and as a signal that there is a transition from one activity to another.

Teach the student the kinds of questions to ask when the student does not understand (e.g. "I didn't hear that", "I don't understand"), and staff should be trained to notice the indications of misunderstanding and confusion.

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As a child shifts from a visual linguistic system to an auditory linguistic system, there will likely be a delay in assimilating information presented through spoken English. Allow additional processing time for the student to receive, comprehend, and respond to information presented in spoken language.

Broadcast music through the child's FM system when using a CD player or tape recorder. Send home song lyrics and tapes of song melodies before they are introduced in music class.

Modify testing to include:

- untimed standardized tests at onset of transition
- opportunity to be exposed to a variety of testing situations
- extra time for essay tests

ADDITIONAL SERVICES:

Provide individual aural habilitation and speech-language therapy given by one or two different professionals who have specific expertise in the area of spoken language development among deaf and hard of hearing children, and in the use of cochlear implants. Frequency of services will vary for each student and recommendations regarding service delivery should be determined by the student's educational team.

The student's speech therapist and classroom teacher should communicate regularly with the cochlear implant audiologist, providing information on the student's listening behaviors and changes in speech that may occur to facilitate optimal mapping of the implant.

If the student with a cochlear implant requires support from a Sign Language interpreter during the transition, teachers and students in the class should be prepared with guidelines related to the use of an educational interpreter. [Please refer to information

provided by the Massachusetts Commission for the Deaf and Hard of Hearing: *Educational Interpreters* <http://www.state.ma.us/mcdhh/401.htm> and *Suggestions for Effective Use of Interpreters* <http://www.state.ma.us/mcdhh/604.htm>]

Prior to arrival, explanation of the specific needs of a student with a cochlear implant (seating arrangements, a rule where one person at a time speaks in the classroom, use of a note taker, etc.) should be provided. Other class members should also receive information that is appropriate for them in understanding what the implant device is and the communication needs of the child entering their class.

Annual in-service training is needed for all staff that work with the child regarding the proper use and care of the cochlear implant speech processor. This training should also include the effects of hearing loss on language and learning and social skills, academic programming for students with cochlear implants functioning as hard of hearing children, working with language facilitators, sign/oral interpreters, and collaborating with a teacher of the deaf and the implant team. Classroom observations and support by a speech

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language pathologist or teacher of the deaf who is experienced with cochlear implants should take place several times during the year. Feedback from older cochlear implant users or Deaf children who have been successful in a mainstream program is helpful in determining the most successful intervention/supports for children with cochlear implants.

EQUIPMENT CONSIDERATIONS:

Identify at least one staff member who is responsible for doing a sound check of the cochlear implant as well as checking the FM system each morning. A separate individual should also be identified as a back up, in the event that the primary staff member is unavailable on a given day. Both staff members should be trained in basic equipment troubleshooting and be provided with several spare cords and batteries. Do a daily equipment check of Program #, volume and sensitivity settings, battery status, coil, microphone, cords, and connections. Refer to the cochlear implant audiologist's report for correct settings and the CI manufacturer's Educator's manual for equipment check protocol and troubleshooting guide.

Upon arrival at school, perform a daily listening check using the Ling 6-sound test ("m", "ah", "oo", "ee", "sh", "s").

Avoid or eliminate plastic, vinyl and nylon materials (e.g. plastic slides, swings, and climbing structures, nylon tents and parachutes, gym mats, etc.) to prevent damage to the processor from static electricity.

The body-worn processor, microphone and headpiece should be removed from the student's body before going down a plastic slide, playing in a ball pit, tumbling on plastic mats, and playing under a nylon parachute or tunnel.

Provide a glare/static screen for the computer and a rubber mat under the chair, if the area is carpeted, to avoid static electricity damage to the speech processor.

To avoid the transfer of static electricity, touch metal or the student's arm before touching the equipment (coil, cord, microphone, or body-worn processor).

Use dryer softener sheets on hair and clothing during the winter. Spray rugs with a solution of water and fabric softener to reduce static electricity.

Cover the speech processor with a plastic bag when playing near water, painting or cooking.

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GLOSSARY

Acoustics

- The sound qualities of an enclosed room (such as reverberation, background noise) that either enhances or interferes with listening to a person speaking
- Auditory-linguistic system

➤ A rule-governed language that is primarily expressed through speech and understood through listening.

HVAC

➤ Heating, ventilation, and air conditioning system of a building

Incidental learning

➤ Learning that is not directly taught, but that occurs through natural, spontaneous, or daily experiences

Incidental auditory learning

➤ Incidental learning that occurs through listening such as “overhearing” something said in a conversation

Intelligible speech

➤ Articulation of spoken words that is understood by most people in most contexts

Language facilitator

➤ A professional who is qualified to assist a child in understanding the language being used in the classroom by the teacher and by peers. A language facilitator is not an interpreter, but works directly with the child in learning and communicating

Language vs. Speech

➤ Language and speech are *not* synonymous.

➤ Language is a rule-governed set of arbitrary symbols that is socially shared among people within a culture or community. Language can be encoded through vocal/spoken words, through symbolic and meaningful visual/manual signs, and through written form.

○ Receptive language refers to how an individual understands language (e.g. comprehends questions, statements, stories, etc.).

○ Expressive language refers to how an individual uses language (e.g. communicates needs, shares ideas, requests information, asks questions, expresses thoughts or feelings, etc.).

➤ Speech involves articulate utterance of vocal sounds to produce distinctive words. It requires the coordination of the articulators (lips, tongue, teeth, and soft palate) and modulation of voice.

Oral language base

➤ Having the fundamental skills of a language that is learned through listening and speaking

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Personal FM

➤ An assistive listening device that is coupled to a child’s hearing aid or implant processor and directs the speech signal (e.g. the teacher’s voice or of another student) directly to the child’s personal listening device to help eliminate competing background noise

Pragmatics

➤ Refers to the way language is used within social communication interactions (such as how to initiate a conversation, use of appropriate eye contact, when to change the topic, how to politely interrupt or join a conversation, etc.)

Processing time

➤ The time required for a person to make sense of the language (either offered through speech or sign) in order to comprehend or respond

Repair strategies

➤ Communication strategies used when there has been misunderstanding in a communication interaction; strategies may include asking a direct question, rephrasing, repetition, etc.

Sound field FM

➤ An assistive listening device that amplifies the speech signal (of the person speaking through the microphone) through speakers that are either positioned around the room or through a portable speaker that sits on a student's desk
Visual-linguistic system (e.g. American Sign Language)

➤ A rule-governed language that is expressed through a visual-gesture system that uses handshapes combined into distinctive movements and placements, and incorporates facial expressions that mark specific grammatical structures.

For further information regarding other relevant terms and definitions visit the *Hands & Voices* website at http://www.handsandvoices.org/resource_guide/19_definitions.html.

The product of a collaborative project sponsored by the Boston Center for Deaf and Hard of Hearing Children (BCDC) and the Cochlear Implant Program of Children's Hospital Boston.

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The Boston Center for Deaf and Hard of Hearing Children (BCDC) and the Cochlear Implant Program of the Children's Hospital Boston convened a series of meetings and invited representatives from schools and programs for the deaf from Massachusetts and the New England region to participate. Development of these guidelines resulted from discussions and information shared among participants in these round-table forums. Audiologists, speechlanguage pathologists, teachers, and psychologists who work with deaf and hard of hearing children, both in private practice and from educational programs that use American Sign Language (ASL), Signing Exact English (SEE-II), sign-supported spoken English, and aural/oral communication, collaborated in the design of these guidelines. For more information, inquiries regarding the guidelines and its collaborators may be directed to Terrell Clark, Ph.D. via Email at this address: terrell.clark@tch.harvard.edu

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