



TOOLS for TODDLERS

Using NORMAL DEVELOPMENTAL MILESTONES with Very Young Children who have Cochlear Implants

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Why should we use normal developmental milestones?

1. Children who are deaf have the potential to learn to hear and speak with a cochlear implant.
2. Specific goals can be developed for children with cochlear implants using normal developmental milestones for vocabulary, speech, and language as a guide.
3. Progress can be measured to determine if a child is meeting appropriate milestones.

Begin by establishing the child's "hearing age"

To use normal speech and language milestones to monitor the performance of children who are deaf, you must first establish the child's hearing age. When a child's cochlear implant is activated he/she celebrates a hearing birthday, and a "hearing age" is used to indicate the child's length of time with the cochlear implant. Skill level at the hearing age is compared to the chronological age. When there is a gap between the two ages, therapy goals are set to help the child "close the gap" with the ultimate objective that the implanted child will eventually reach the skill level of his normal-hearing peers.

Children 1 year of age and older are approved for cochlear implantation. The table below, from asha.org, includes listening and speaking milestones for children birth to 2 years of age with normal hearing and can be useful for assessing the post-operative progress of children with cochlear implants.¹

Hearing and Understanding	Talking
0–3 Months <ul style="list-style-type: none"> • Startles to loud sounds • Quiets or smiles when spoken to • Seems to recognize caregiver voice and quiets if crying • Increases or decreases sucking behavior in response to sound 	0–3 Months <ul style="list-style-type: none"> • Makes pleasure sounds (cooing, gooing) • Cries differently for different needs • Smiles when sees parent
4–6 Months <ul style="list-style-type: none"> • Moves eyes in direction of sounds • Responds to changes in tone of your voice • Notices toys that make sounds • Pays attention to music 	4–6 Months <ul style="list-style-type: none"> • Babbling sounds more speech-like with many different sounds, including p, b and m • Vocalizes excitement and displeasure • Makes gurgling sounds when left alone and when playing with you



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Hearing and Understanding	Talking
<p>7 Months–1 Year</p> <ul style="list-style-type: none"> • Enjoys games like peek-o-boo and pat-a-cake • Turns and looks in direction of sounds • Listens when spoken to • Recognizes words for common items like “cup”, “shoe,” “juice” • Begins to respond to requests (“Come here,” “Want more?”) 	<p>7 Months–1 Year</p> <ul style="list-style-type: none"> • Babbling has both long and short groups of sounds such as “tata upup bibibibi” • Uses speech or non-crying sounds to get and keep attention • Imitates different speech sounds • Has 1 or 2 words (bye-bye, dada, mama) although they may not be clear
<p>1–2 Years</p> <ul style="list-style-type: none"> • Points to a few body parts when asked • Follows simple commands and understands simple questions (“Roll the ball,” “Kiss the baby,” “Where’s your shoe?”) • Listens to simple stories, songs, and rhymes • Points to pictures in a book when named 	<p>1–2 Years</p> <ul style="list-style-type: none"> • Says more words every month • Uses some 1-2 word questions (“Where kitty?” “Go bye-bye?” “What’s that?”) • Puts 2 words together (“more cookie,” “no juice,” “mommy book”) • Uses many different consonant sounds of the beginning of words

Therapy Planning

Each therapy session should contain goals and activities related to each area of development: Audition, Cognition, Speech, Language, and Vocabulary, as well as activities parents can do with their children to reinforce the concepts learned in therapy.

Auditory Goals

Below is a list which includes some examples of activities that may be included at each level of the auditory hierarchy.

Hierarchy of Listening Skills	
Adapted from Figure 4.1, Estabrooks, W. (Ed.) 2006. Auditory-Verbal Therapy Theory and Practice, p. 78.	
<p>Detection</p> <ul style="list-style-type: none"> • Conditioned play response • Spontaneous alerting response 	<p>Identification</p> <ul style="list-style-type: none"> • Suprasegmentals <ul style="list-style-type: none"> - Prosodic features of speech - Loudness and pitch - Angry and sad voices - Male, female, and children’s voices • Segmentals <ul style="list-style-type: none"> - Initial “sound” vocabulary - Words varying in number of syllables • Words in which the vowel is constant and the consonants contrast in manner, place, and voicing • Two critical elements in a message • Auditory monitoring of segmentals
<p>Discrimination</p> <ul style="list-style-type: none"> • Same/different tasks <ul style="list-style-type: none"> - One, two, three-syllable word discrimination - Minimal pair discrimination 	



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Hierarchy of Listening Skills - continued	
Comprehension	
<ul style="list-style-type: none"> Familiar expressions/common phrases Single directions/two directions Classroom instructions Sequencing three or more directions Sequencing three events in a story 	<ul style="list-style-type: none"> Answering questions about a story: closed set and open set Comprehension activities/exercises in noisy environments

**It is important to note that children with cochlear implants may not need formal teaching of each goal at each level due to advances in cochlear implant sound processing. Often children do not require formal training at the discrimination level.

Speech and Language Goals

Use of the chart below can be helpful for establishing specific goals for acquiring new vocabulary.

Rate of Vocabulary Acquisition ^{2,3}	
12 months	First expressive word appears
18 months	20–100 words
24 months	300 words
36 months	900 words
48 months	1,500 words
60 months	2,500 words

Therapy Tips

1. Write very specific short-term goals. Example: "Given auditory input, child will learn 10 new words per week. Child will demonstrate comprehension of 2–3 critical elements in a message through audition alone."
2. Therapy sessions are diagnostic, so stay one step ahead of the child's skills (or two!) and be prepared to adjust the activity as needed.
3. Therapy is fun and functional. Avoid activities the child has mastered in the past, except for review.
4. The parent can be an active participant, not a passive observer. Don't forget to involve mom and dad!
5. Set high expectations for the child from the beginning.
6. Be prepared for the unexpected! When therapy "falls apart" have a bag of tricks to engage the child, such as a hand puppet or a pop-up toy, to get the session going.

References:

1. How Does Your Child Hear and Talk? Available at http://www.asha.org/public/speech/development/child_hear_talk.htm. Accessed October 5, 2006.
2. Flexer, C. 1994. Facilitating Hearing and Listening in Young Children. San Diego, CA: Singular Publishing Group, Inc.
3. Sindrey, D. 1997. Listening Games for Littles. London, Ontario. Word Play Publications.