Loud and Clear!

Bringing Sound to Life

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In this issue, we present a selection of the teaching strategies included in the *Bringing Sound to Life: Principles and Practices of Cochlear Implant Rehabilitation[1]*, a video training program developed for professionals and parents working with children with cochlear implants.

3-D therapy: The Three Dimensions of Rehabilitation

Rehabilitation of a child with a cochlear implant is not a "linear" process. Professionals need to assess and respond to myriad factors that may have an impact on the child at any given moment. In addition, professionals must determine appropriate goals and strategies to be implemented in therapy, as well as at school and at home. Finally, the therapist must facilitate carryover. The rehabilitation process can be optimized when parents and professionals work together to ensure continuity of input and expectations in the routines of daily life.

The first "dimension": DIAGNOSTICS

Within the diagnostic dimension of therapy, the question is asked **"Where are we now?"** Using both formal and informal assessments, professionals need to determine a baseline of auditory, cognitive, and communication skills. This assessment will

serve as a foundation for determining not only goals, but also problems such as faulty equipment, inappropriate speech processor programs as well as related developmental language and speech delays.

Some of the ways in which the diagnostic dimension of the rehabilitation process can be integrated into a child's daily routines include:

▷ ***Daily administration of the Ling 6-Sound Test at home, clinic and/or school.*** If the child is too young to perform a conditioned response task, use the Ling[2] sounds (mm, ah, oo, ee, sh, ss) in interactive syllable play. Observe the child's response to sounds when visual cues are not present.

▷ ***Daily syllable imitation tasks to assess and monitor quality of approximations.*** Once the child has developed a sufficient auditory feedback loop (the ability to imitate/approximate sounds that are perceived through listening alone), then a baseline of imitative skills should be established. The baseline should include vowels, diphthongs and consonants in isolations, as well as simple consonant + vowel (CV) , VC and CVC combinations appropriate to the child's individual level. This baseline should be monitored regularly to ensure that the child is still hearing/producing the sounds and syllables at or above baseline levels. This task should not be confused with a conventional articulation task where the focus is on production. Syllable approximation focuses on how a child hears voice quality and intonation patterns.

⇨ *Informal observation of a child's response to environmental and speech sounds; observation of voice quality, intonation and articulation.*
Experienced clinicians always take into consideration a child's mood, attention and health in assessing responses.

⇨ *Regular administration of standardized tests* for receptive and expressive language, speech perception and production, and cognitive development.

The second "dimension": DEVELOPMENT

The second dimension of "3-D" rehabilitation therapy is "development." The sequence of intervention is largely based upon the typical development of speech and language in hearing children. Within the developmental dimension of intervention, the question is asked, *"Where do we need to go?"* The diagnostic dimension of rehabilitation provides clearly defined areas of strengths and areas of need. The results of the diagnostic assessment provide the direction and goals for the course of intervention in the clinic, home and school-the defined path of development.

In establishing appropriate goals, one must consider the child's age, interests and developmental levels[3]. A three year old may have relatively advanced listening skills and be able to follow two-step directions with multiple critical elements in an activity with farm animals. A child implanted in adolescence with minimal auditory experience, will need an activity with very basic listening goals, such as pattern perception. Still it is important that the activity be of an age appropriate interest level. This would include content from academics, vocabulary from popular music or TV shows, or words and phrases that a teenager would use in everyday conversation with peers[4]. *It is important to establish skill appropriate goals, with age-appropriate content.*

The third "dimension": DEMONSTRATION

The third dimension of "3-D" rehabilitation therapy is that of demonstration, or training parents and other professionals to provide effective intervention for a child with a cochlear implant. Within the dimension of demonstration, the question is asked, *"How will we get to where we want to go?"*

If effective listening is the foundation of spoken language, then learning to listen must become a priority throughout the child's day, whether at school, at home, in the clinic, or at the daycare center. To achieve this, parents and professionals need to be trained in specific strategies to maximize listening within the routines of everyday life. This can be achieved by including parents in all therapy and demonstrating to them the techniques that can be used both in formal and informal interactions to develop auditory skills. The parent watches the therapist, and then the roles are reversed. The parent takes the lead in the therapy activity.

Activities that may seem "simple" to an experienced therapist, such as a conditioned response task or playing a lotto game focusing on auditory skills development, may be very challenging for a parent. It is important for the therapist not only to demonstrate, but also to guide the parent through the task, and give ample practice to master the task[5].

The therapist may guide the parent throughout the session, or may choose to videotape the parent lesson segment. Discussion and instruction while viewing videotaped segments of therapy is efficient in that it eliminates interruption of the actual session. Videotapes of therapy are also extremely valuable when shared between the clinic, home, and school.

Throughout the years of intervention, professionals will need to maintain a focus upon the three dimensions of rehabilitation. The integration of diagnostics, development, and demonstration will continue to provide the foundation for fulfilling a child's communication potential.

Breaking the Parroting Habit

*While it is encouraging to see a child able to imitate a wide range of sounds quickly, parents and professionals should be cautioned that imitation is not the same as language. A parrot can learn to imitate words and phrases, but that is not language. It is important not to just **imitate**, but to **integrate**.*

To encourage the development of a child's memory of how to produce or articulate a word so that it may be used later in spontaneous speech, the child needs to begin to transfer that motor pattern of articulation into the long-term memory. Simply "parroting" a word demonstrates the auditory feedback loop, but does not reflect the ability to generate that word without a model.

Steps to break the Parroting Pattern:

1. First, model the word you want the child to imitate.

2. Encourage the child to imitate the word.

3. Reinforce the child's effort by saying "Good job!"

4. Encourage the child to repeat the word again without a model.

5. The child attempts to produce the target word without a model.

Example:

The "target" word is "Sparky" (the name of the family dog). The child is able to correctly imitate the word, but spontaneous production is "Argy."

1. Signal child to listen, and then model slowly and precisely "Ssspaaarky."

2. Give child opportunity to imitate-encourage best effort.

3. When child makes a closer (i.e. "Sparty") or accurate approximation ("Sparky") cheer the child!

4. Encourage the child to say it again without a model. "That's great! Can you say it again?" or "Let's call the dog-"

5. Child says "Sparky."

This simple communication sequence, when used throughout the day, will help the child develop an internalized system of motor planning for speech.
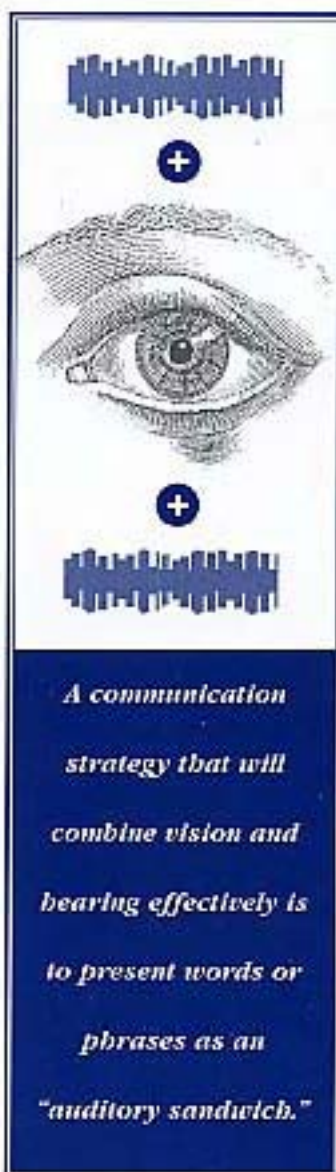
The Auditory Sandwich

Based on the premise that the visual sense tends to dominate in the early stages of auditory skill development, it is important to "provide auditory first." However, it is equally important that understanding be maximized. Learning to listen AND the development of linguistic and cognitive skills can co-exist. A communication strategy that will combine vision and hearing effectively is to present words or phrases as an "auditory sandwich."

Recipe for an Auditory Sandwich

1. Present the AUDITORY INFORMATION FIRST.

2. Repeat as many times as is necessary to make an "auditory impression" (the first "slice of bread" in the sandwich.)

3. Provide a visual clarifier (the contents of the sandwich) such as the object or picture, a sign or Cued Speech cue

4. Restate the auditory information to finish the sandwich. This "auditory sandwich" technique effectively reduces dependence on signs or lipreading. If the child responds after being given the auditory information-there is little reason to provide the visual support. Thus, the child becomes the best indicator of when it is time to drop a sign or Cue.

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Although a child may not need signs or Cues for much of the language of the daily routines, they may still be required for two important reasons:

1) Continued input for cognitive development at age appropriate levels. While the child may be able to understand routine language, new concepts and vocabulary will need a strong visual system until the auditory system is able to process and retain new information.

2) Provision of a communication system that the child can use for expressive communication until the motor activity of speech is sufficiently developed for the child to be understood[6].

Manual signs are extremely "handy" when clarifying a word or concept. Signs are always available and can represent thousands of words that cannot be touched, seen or drawn. They are, in effect, a "linguistic snapshot" for abstract, as well as simple, words and concepts. For example, when a child finishes a cup of milk the opportunity arises for discussing "empty". While a parent might point to the cup and say "The cup is empty", the child may not know what is being referred to. Is it the cup? Is it the color of the cup? Is it the shape? Presenting a standard sign provides the child with a cognitive and linguistic reference point that can be used in a wide variety of situations. With repetition and variety, the child integrates the new concept into his linguistic experience. He is then able to transfer that concept to an auditorally-based symbol, the spoken word.

Providing auditory information first, then visual clarification (through signs, pictures, cues, objects), then an auditory review is one of the most valuable communication techniques for clinicians to use with children wearing cochlear implants. It is also an effective diagnostic tool for determining when a child no longer needs signs to supplement speech.

It's all a G*A*M*E!

Professionals and parents recognize the importance of integrating listening and language into interactions throughout the day. Often people say, "I don't want my life to become a therapy session." Natural learning and the goals of therapy can co-exist without becoming a chore for either the adult or the child. A few basic principles and guidelines can establish a "road map" which can effectively integrate the goals of therapy with child's work (that is, PLAY) whether in the clinic, at school, or at home.

Goal: Establishing appropriate goals is the first step in developing spoken language skills in both formal and informal interactions. The goal must be challenging without being frustrating. The goal may be as simple as detection of sound, or as complex as multiple critical elements presented at a rapid rate of speech.

Activity: A therapy activity can be as structured as a formal language test or as informal as going for a walk. Anything that provides the potential for listening and language can serve as an arena for learning. An activity may be the "Go Fish" game, playing catch with a ball, a review of classroom vocabulary or a trip to the grocery store.

Motivation: If a child is motivated, the door to learning is wide open. Without motivation, the child has no incentive to attend, cooperate, or retain the skills necessary for developing meaningful communication. A simple motivator can transform a boring activity into an engaging interaction. Motivators can include hiding stickers under stimulus pictures or objects, finding pennies to put into a mechanical bank, or accumulating "points" for an end-of-session test.

*"Natural learning and the goals of therapy can co-exist without becoming a chore for either the adult or the child. Remember, to a child, it's all a G*A*M*E!"*

Evaluation: In order to be effective, a parent or professional must be reflective about the appropriateness of an activity and the response of the child. Modifications should be made whenever necessary during an activity to ensure progress.

Sample G*A*M*E: Beginning listener
Goal: Identification of objects with one critical element (shapes).

Activity: Cutout shapes.

Motivator: Small stickers hidden under stimulus shape.

Evaluation: Number of correct identifications, engagement with activity.

Sample G*A*M*E: Intermediate listener
Goal: Identification of pictures with 3+ critical elements

Activity: Photo/object match (photos are taken of miscellaneous objects in a variety of positions in, on, under, beside, etc. Directions are given to place objects to match picture.

Motivator: Seeing photograph and determining if the object arrangement matches.

Evaluation: Determination of child's engagement, ability to identify critical elements, and need for modification of presentation factors. Remember, to a child, it's all a G*A*M*E!

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