

# Loud & Clear!



A Cochlear Implant Rehabilitation Newsletter

Issue 1 2006

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Nurturing Music Development in Children With Cochlear Implants

## BRINGING MUSIC TO THEIR BIONIC EARS: Nurturing Music Development in Children With Cochlear Implants

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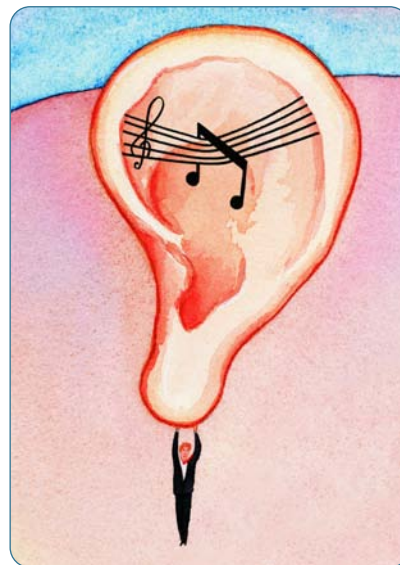
Editors: Amy Robbins, MS, CCC-SLP, and Patricia Trautwein, AuD

A baby's first smile—what an amazing event. Sometime around six to 10 weeks after birth, they begin to charm us with those loveable toothless grins! Around the same time, babies begin to alert and calm to music. It's no wonder, then, that cultures across the globe have discovered the power of song, particularly the lullaby. Paired with rocking, walking, bouncing and patting, lullabies are effective when it comes to easing the distress of a screaming infant.

Even though adults have been intu-

itively using this process for centuries, we now know that it also reinforces two of music's most salient elements—rhythm and

pitch (see Glossary). But is that important for a child with a cochlear implant? Based on the credible notion that nearly all children have some music aptitude, or the ability to learn music, it means a great deal!



We will examine the music development of normal hearing children and how it compares to our implanted youngsters. We will give you some ideas to help encourage and nurture music development. We will also list some valuable resources to support you as you encourage and nurture your child. Why? Because as caring adults, we have the responsibility to provide an environment where music aptitude

is turned into music achievement and enjoyment for life.

The music development of hearing children is very similar to language development in that it

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follows a time-ordered sequence of skills or musical milestones (Table 1). But, imagine that just as implanted children have a “hearing age,” meaning the developmental level from the time of the first cochlear implant fitting, rather than chronological age, we talk now of a “musical age.” So, regardless of the chronological age of children, once they begin to hear music, they will likely pass through the stages in sequence. For instance, a hearing child will not be able to sing “Happy Birthday” all the way through on pitch, without first gaining expertise in beat, rhythm, words, pitch, tonal center and melody. Neither will the implanted child. These are all skills typically learned before a child goes to kindergarten. For children with implants, this may be later, but it still means that the nurturing of these skills must be done in the same way, in the home and by any other caregiver who interacts with them. But don’t worry; it’s not as difficult as it sounds.



## THE FIRST YEAR

As stated earlier, all children are born with some music aptitude, and we know that early in life, music aptitude is combination of innate (nature) and environmental (nurture) influences. So, just because a child is born with a hearing loss, doesn’t mean we should stop rocking or singing to them! Studies show that even children with

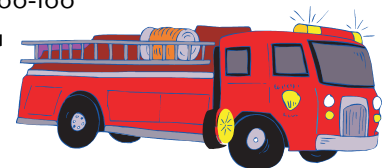
profound loss can still access some rhythmic and tonal elements of music and derive enjoyment from it. As the development of implants continues to evolve through advanced technology, many more spectral and temporal aspects of music will be available to our children. It could be exactly what is needed to help them realize their musical potential.

It is critical to bounce, pat, spin and rock those babies to music. Whether singing songs or listening to CDs, it is important to emphasize the steady beat of the music. Bounce them to rhymes, songs, or chants. Pump their legs, or pat their back

to the beat. Insert the child’s name in familiar songs and use specific songs throughout the day to emphasize a particular activity. For example, waking up, getting dressed, changing diapers (lots of room for creativity here), eating, bath time, and bed time. It can be a helpful way to reinforce schedule and ease transitions between activities. Be sure to have a selection of rhythm instruments readily available. Shakers, drums, jingles, clackers and xylophones are good choices for first instruments. As children gravitate toward certain instruments, make sure you label them (that’s a shaker, drum, etc.) and give its sound a word (shake, shake, shake or boom, boom, boom, etc.).

As babies begin their music babble, reinforce it by imitating them. Music babble differs from speech babble in that it encompasses a large frequency range, usually descending, and is sung on vowels, or as mouth sounds (raspberries) rather than repetitive syllables like ba, ba, ba. The onset of musical babble will vary depending on when the child receives an implant. If the child is older, it will still be important to reinforce this developmental stage; however, he/she may pass through it quickly. In time, they will imitate you and ultimately, you will have a musical conversation. Be sure to emphasize the whole range of sounds so they become used to their singing voice. As they become familiar with certain songs, start leaving out the last word in the phrase and see if they can insert the word or pitch for you. For example, Twinkle, twinkle little \_\_\_\_, How I wonder what you \_\_\_\_, etc.

Occasionally, close to the first birthday, hearing babies will begin matching a few pitches they hear sung to them. Again it is important to reinforce the pitches they are matching. Play little “loo-loo” games where first you match their pitch and then they match yours. Pretend you are a fire engine siren.



Use your finger to trace an arc in the air as you move the pitches up and down.

## THE SECOND YEAR

Think about what is happening with a typically developing baby during this time. Walking and talking, for starters! Now, instead of just moving their arms to the music, they are going to try dancing (and falling down a lot). This is a perfect time to introduce a song like, “Ring around the Rosy” and other songs that include spinning, rocking side-to-side, kneeling, and going and stopping. If the music stops, they must freeze; when it starts, they move. Dancing in mom or dad’s arms is such a wonderful way to keep the connection between movement and music alive and to reinforce steady beat. Or, for even more fun, try dancing them on your feet. Be sure to choose music that has a strong beat (see Resources).

About the time that language begins to emerge, you will hear children making up little spontaneous songs during their play-time. Implanted children will pass through this stage as long as they have had some exposure to music. Most of these songs will be steady in rhythm and in a fairly small pitch range. They will be about what the child is doing, what is in their environment, or just pure nonsense. Typically, children settle into a range of C4–G4, or middle C and the four notes above that. So, when singing with them, be careful not to sing too high or too low when working on developing pitch. However, a fun game can be to sing a song in different ranges (i.e., how would it sound if a little mouse sang this song or a big bear? What if you sang in your littlest voice or your biggest voice?).

This is a great time to introduce songs that have a lot of repetition. “Old MacDonald” has appeal because, E-I-E-I-O, repeats over and over. The child can prepare for its return and successfully join in. “Bingo” is another example. At this age in typical children, imitation of words will be more accurate than either the rhythm or pitch of the song. It may be different for children with implants who are beginning to use expressive language. They may be the most successful with rhythm. To encourage development of pitch and reinforce the rhythm, try singing the song on a loo, la, or da—most syllables will work.



## THE PRESCHOOL YEARS

As the child approaches age three, circle games and dances will become appealing. They will also be marching and clapping to music. However, they will not be very successful at keeping the steady beat throughout a whole piece of music because while they can successfully keep time to their own songs, they can’t yet match it to others. That comes a bit later.

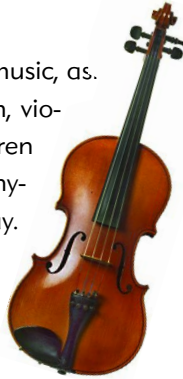
This is also the time that you will hear the children’s teasing song. Remember, “Na, na, na, na, na, you can’t catch me” or “Rain, rain, go away, come again another day?” Those little songs have only three pitches in them, but, perhaps the three most important pitches of all. Children everywhere use them and research shows that they are the first intervals (differences between pitches) children learn to sing. Take a picture book, like “Each Peach Pear Plum” by Janet and Allan Ahlberg, or almost any book by Eric Carle and sing it using the “teasing song” as a guide. Pairing the visual with the aural reinforces the learning process.

Once a child has had many opportunities to listen to and make music, they are ready to understand concepts like fast/slow, up/down, loud/soft, and high/low. These can easily be taught through music. A slide whistle is perfect for up/down. Take any familiar song and sing it fast/slow, loud/soft, and high/low.

Around age four, a particularly fun listening game is to hum a favorite song and have them try to guess what song you are humming. Without the words as clues, hearing children will have a hard time guessing. Even such frequently heard tunes as “Happy Birthday” will stump them. Try inserting one or two words at the end of the phrase, hm, hm, hm, hm, to you and see if they can guess it then. If it still evades them, sing Happy hm, hm, hm, hm and see what happens.

By age five, or so, this game becomes much easier. Children are also trading in their spontaneous songs for composed songs. Their ability to hold on to a tonal center (staying in the same key from beginning to end) is strengthening. They also delight in being able to discriminate between different instru-

ments and voices. When listening to a piece of music, ask the child what they hear. Is there a piano, drum, violin, or trumpet? Are there men or women or children singing? Ask if the music makes them think of anything else, or if it makes them feel a certain way. If the song were to be painted, would it have a color? This is a prime time to use books that are based on familiar songs, so they can read and sing at the same time (see Resources).



There are currently a number of preschool music programs available to parents and their children. They are developmental in their approach and foster an early appreciation for music. Also, they may identify those children who seem to have an advanced aptitude for music and possibly make recommendations regarding individual music lessons. Most are open to including children with implants. However, the group setting may be a bit overwhelming for the child unless there has been plenty of opportunity to experiment with music on an individual basis first, as in daycare, home, and speech or music therapy.

### THE SCHOOL-AGE YEARS

Once a child enters school, it is typical for caregivers, classroom teachers and parents to turn musical responsibilities over to the school music teacher, thinking that the professional can carry on from here. However, there is still a lot of musical development that can be nurtured by the non-professionals. For instance, children are still learning to sing melodies on pitch and to be able to conserve them enough to sing a harmony. This is a wonderful time to dust off those rounds we all sang as kids. "Row, Row, Row Your Boat," "Ram Sam Sam" and "Kookaburra" are still favorites. Sequential songs like "I Knew an Old Lady Who Swallowed a Fly" develop memory

skills. Pairing motions with lyrics of songs also helps with memory. Children need to be introduced to a variety of musical genres and instruments to make decisions about their own preferences. With the current emphasis on cultural diversity and because music is an expression of every culture, children should be exposed to music from all over the world.

Children of this age typically have a preference for music that is sung or played at a faster tempo. Their ability to repeat rhythmic patterns and keep them constant throughout a piece of music has also greatly expanded, as well as their interest in learning to read music notation. Instruments like the soprano recorder or xylophones make good first choices for playing simple melodies and accompanying themselves. While students are singing less spontaneous songs, they still need opportunities to improvise (make up) music. Creating their own chants, songs and musical games fosters higher levels of thinking.



It is important at this stage to be sure that music teachers are informed about the best way to handle implants—where to seat the student, how to use an FM system, etc. See the Parent and Educator's Guide to Cochlear Implants and other publications from Advanced Bionics for more information on classroom seating and FM systems ([www.bionicear.com](http://www.bionicear.com)).

### MUSIC ACHIEVEMENT

So given what we know about the music development of normal hearing children, what can we expect musically from our children with implants? There will probably be a wide range of musical achievements, just as there is within the hearing population. The age at implantation may be just as critical

to music aptitude and achievement as it is in speech and language acquisition, meaning the earlier, the better. Some will go on to excel at a particular instrument; others will enjoy the social aspect of singing in a choir or playing in a band. Still others (perhaps a majority) will listen to music informally and sing the occasional, “Happy Birthday,” and

“Take Me Out to the Ballgame,” just like the rest of us. While we can’t predict outcomes specifically, we can be sure of two things—a sophisticated implant capable of translating the spectral and temporal complexities of music and a musically rich environment will go a long ways toward realizing music achievement. ✎

## GLOSSARY

**Composed songs** Songs written by others; traditional folk tunes.

**Music aptitude** The ability to learn music.

**Music achievement** The potential of music aptitude.

**Music babbling** The verbal sounds made in response to hearing music.

**Music notation** The symbolic written representation of music.

**Pitch** The place on a high or low frequency continuum.

**Rhythm** The grouping of beats into patterns.

**Singing voice** The voice’s ability to use a large spectrum of frequencies (pitches); different from a speaking voice.

**Spectral** The wide range of frequencies (pitches) available to the human ear.

**Spontaneous** Songs made up on the spur of the moment.

**Steady beat** The underlying pulse of a piece of music.

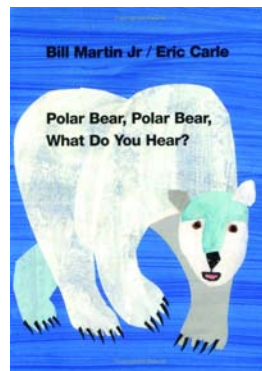
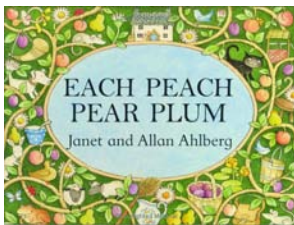
**Tempo** The speed at which music is played or sung.

**Temporal** Everything related to timing in music.

**Tonal center** The scale tone around which a piece of music gravitates; sometimes called the key.

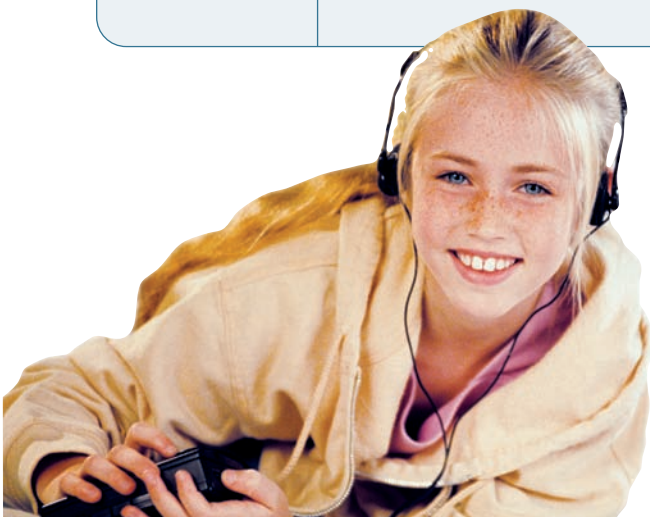
## RESOURCES

1. *Each Peach Pear Plum*. Janet Ahlberg and Allan Ahlberg. Viking Kestral. Clever story incorporating Mother Goose characters accompanied by delightful illustrations.
2. Elderly Instruments, Lansing, Mich: [www.elderly.com](http://www.elderly.com). A fine catalogue of mainly acoustic instruments and all genres of folk music.
3. Music Together: [www.musictogether.com](http://www.musictogether.com). A music and movement approach to early childhood music development for young children and their parents/caregivers. Classes offered nationwide.
4. *Polar Bear, Polar Bear, What Do You Hear?* Bill Martin Jr. and Eric Carle. Picture book with a strong emphasis on language development.
5. Putumayo Kids: [www.putumayo.com](http://www.putumayo.com). A collection of world music CDs especially for kids.
6. Remo Kids Percussion: [www.remo.com](http://www.remo.com). Durable, attractive, authentic-sounding percussion instruments.
7. Rhythmically Moving Series by Phyllis Weikert: [www.highscope.org](http://www.highscope.org). A collection of multicultural folk music CDs useful in practicing steady beat.
8. West Music, Coralville, Iowa: [www.westmusic.com](http://www.westmusic.com). A resource for instruments, recordings and educational supplies. Music therapist on staff.



## MUSIC MILESTONES IN TYPICAL HEARING CHILDREN

AGE	MUSIC MILESTONES
Birth–2 months	Alerting/calming to music
2–6 months	Musical babbling; repetitive movements in response to music; turns to the source of music
6–12 months	Spontaneous songs; occasional pitch and beat matching; larger repetitive movements
12–8 months	Dancing to music; attention to lyrics; snippets of learned songs; more pitch matching
18–24 months	Looking for dance partners; spinning, marching to music; spontaneous songs have steady rhythm; able to imitate songs; words more accurate than pitch
2–3 years	Learning singing versus speaking voices; singing in different keys and meters; playing simple melodies on xylophone; using instruments to accompany their singing; some instrument discrimination
3–4 years	Some discrimination between instruments (timbre); using rhythm instruments to accompany their songs
4–5 years	Larger movements; imaginative songs and stories; beginning to conserving melody and match beat to others
5–6 years	Beat awareness; singing melody with pitch accuracy; playing melodies on simple instruments; actively listening to music
6–7 years	Developing tonal center; starting to sing harmony; vocal range focused around five to six notes; learns rhythmic notation
7–9 years	Vocal range expanding; beginning to read and write music notation; more complex meters and harmonies; demonstrates music preference



*Since children develop and grow at varying rates, these milestones should be viewed as a range of behaviors considered typical of normally developing children. Just as we speak of a hearing age or language age in implanted children, maybe we can think also of a music age. From the time of access to sound, higher performing implanted children will pass through these milestones in sequence, but at varying rates. There may be delays in some milestones, (pitch related) but many will be mastered.*

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