



SMALL TALK

BRINGING LISTENING AND SPOKEN LANGUAGE
TO YOUR YOUNG CHILD WITH HEARING LOSS

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Free Sample - Chapter 10

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Chapter 10

Listening and Auditory Development

Learning to Listen

As adults, we listen throughout the day without paying much attention to exactly what we are hearing. We hear the alarm go off in the morning and know it's time to get up. We hear the meteorologist explain the forecast for the day as we pick out our clothes. The phone rings and we know to pick it up to see who is calling. The microwave beeps, the smoke alarm blares, a horn honks from the car behind us. The list goes on and on. Without conscious thought, we hear those sounds and know the source; we may even launch into action. However, young children must be taught to associate sounds with meaning.

A baby with typical hearing quickly calms to her mother's voice because she has learned that a soothing voice is usually accompanied by her needs being met. For a child with hearing loss who has had more limited opportunity to experience sound, a properly fit hearing device opens a whole new world of sounds. The big task at hand is helping your child experience each of those new sounds and associate meaning with them. It's important to point out sounds as they occur, to show your child the source of the sound and to use a label or name for that sound. One example is when the phone rings. You say "I hear the phone ringing." Then you go answer it. In this simple interaction, your young child has heard a noise, observed your actions (walking to the phone, picking it up, talking into it) and heard you say "Hello."

Now think of all the sounds in your daily routine and all those opportunities to teach your child to listen! It can be overwhelming to do this all the time, but it will be so rewarding when your child begins to respond consistently to sounds.

Listening with the Brain

As young children we were taught some very basic things about our bodies and senses. Eyes are for seeing; ears are for hearing. Actually, it isn't quite that simple. In fact the "simple" act of hearing is a complicated process that involves the brain. Time and time again parents say "My child can definitely hear, but she doesn't always listen." Now, with the use of hearing devices, even children with profound hearing loss can hear sounds and voices. But the hard work has only just begun. Next, they must learn to listen. The hearing devices help your child gain access to sounds and voices, but those important sounds and voices can't be understood until the message is received by her brain.



“We hear with the brain . . . the ears are just the way in.”
(Cole & Flexer, 2011)

The problem created by a hearing loss is that it blocks messages from getting to the brain. If we give children optimal hearing devices, we can bypass that blockage, giving them access to the sound, and then messages can get to the brain.

Are you confused by all this talk about hearing and listening? Hearing is about getting the sound in to reach the brain. We can help a child hear with hearing devices and by setting up good listening environments.

Listening is what your child does when she pays attention to the sound she is able to hear. This occurs when your child has had enough opportunities to hear and experience a sound, so then she can think and remember what that sound means to her.

So Many Terms...

Auditory — sound information
Audition — the process of hearing and listening
Hearing — sounds and voices going from the environment to the ear to the brain
Listening — the brain making sense of sound

Brain Development for Listening

Do you know the brain has specific areas dedicated to taking in and making sense of auditory information? These areas develop because auditory information makes its way to the brain. When sound doesn't get to the brain, there is no auditory information there to stimulate those auditory areas (Cole & Flexer, 2011). Auditory access, or the act of sound information getting to the brain, is necessary for a child to develop functional listening skills. Studies in brain development show that auditory input greatly affects auditory centers of the brain (Berlin & Weyand, 2003; Boothroyd, 1997; Chermak, Bellis & Musiek, 2007, as cited in Cole & Flexer, 2011). To develop appropriate listening skills, the auditory portion of the brain must have auditory input, or access to sound.

Wearing Hearing Devices

To become a proficient talker, your child must develop listening skills. To develop listening skills, your child needs sounds and voices constantly available to her through her hearing devices. This is necessary so she can learn to rely on using her hearing, just like people with typical hearing do.

Setting the Stage for Learning to Listen

Helping your child learn to attend to sound and associate meaning with that sound requires lots of action on your part. To ensure you're giving your child the best chance possible to learn to listen, check to be sure the following are in order:

- Your child has accurate audiologic testing.
- Your child's hearing devices are fit and working properly.
- You have a solid understanding of your child's hearing loss and devices.
- You are committed to helping your child wear her devices during all waking hours.
- You take immediate action when a medical or audiologic situation arises.

One of the most important things you'll do during this process is to ensure your child's devices are working at all times. For babies and young children who cannot tell you when a device isn't working, it's a good idea to check the devices periodically throughout the day. There isn't any point in wearing a device unless it's working! (For more information on troubleshooting hearing devices, see Chapters 7–9.)

Since you want your child to have access to sound during all waking hours, it's important to have a plan should your child's device break down. Wear and tear can be especially prevalent for devices worn by children. Discuss the options for backup or loaner devices with your pediatric audiologist before you experience a breakdown — so you're prepared if one actually occurs!

Teaching Your Child to Listen

While your child's listening skills are developing, she needs to tune in to sounds happening around her. You can help! First, model listening yourself. Do this by pointing to your ear or cupping your hand around your ear when you hear a sound you think your child might be able to hear. Then tell your child "Listen! I hear the _____."

Think of this as teaching her, not testing her. You may need to do this for several weeks or months before expecting a response. Because listening takes effort and concentration from your young child, provide exposure during all of her waking hours, but give concentrated attention to sound when she is at her best. Eventually, if she is able to access the sound using her hearing devices, your child should notice and attend to sound on her own.

Your child should listen both to sounds happening in her environment (environmental sounds) and to voices (talking). Think about the sounds around you. Here are some examples of environmental sounds to point out:

- sound-making toys
- vehicle sounds (motor sounds and sirens from cars, planes and so on)

Timing of Cochlear Implantation

Many parents who are considering a cochlear implant for their child wonder when the best time is to get the implant. Moreover, many parents wonder if they should hold off on getting the implant until later in the child's life. These are good things to wonder about.

Research suggests children who receive cochlear implants earlier may benefit more from the relatively greater plasticity of the auditory pathways compared to children implanted later (Geers & Nicholas, 2012; Harrison et al., 2005; Manrique et al., 1999; Sharma et al., 2002; Svirsky, Teoh & Neuburger, 2004). In other words, the brain is ready to take in auditory information before a child is born. As the child ages, the brain becomes less able to respond to and sort out auditory information within the brain. The easiest way to think about providing access to sound for a child with hearing loss is . . . the earlier, the better.

- knocking on the door, phones and doorbells ringing
- machines in the home and yard: dryer buzzing, microwave beeping, lawn mower roaring
- sounds produced by contact: hitting, hammering, dropping
- thunder/rain
- music from stereo, instruments, songs, finger plays and so on
- animal sounds (which provide a good transition from sound to speech)

At first, environmental sounds may be louder and more interesting than talk. Remember, your first job is to notice and comment on sound yourself. Next, look for signs your child may be noticing sounds on her own. She may stop her activity, look up, raise her eyebrows, become quiet and seem to listen or even look around when she has noticed a sound. How exciting! She's beginning to pay attention and listen to sounds around her!

You also can help your child learn that sounds are interesting and fun. Act interested and pleased when a sound occurs; seek or look at the source and point it out to your child. Provide repeated exposure to the same sounds day in and day out. Keep telling your child to listen, and associate that with a helpful gesture of pointing to your ear or cupping your hand around it. In the beginning, bathe your child in sound without worrying about receiving a response from her.

Above all, make it fun. If it's game-like, your child will want to play. Once you indicate you have heard a sound and you shrug your shoulders to show that you wonder what it is, you and your child can move around looking for the sound source. Once you find it, point to it and try to get the sound to occur again. Praise your child when she finds the sound source. Clap your hands and say "Hooray." This helps her begin to make the association between the sound and its source. By developing awareness of sound sources, you're working toward teaching your child that sound has meaning.

Stages of Auditory Development

Just like all kinds of development, children progress through auditory development in stages (Sindrey, 2002). The stages of auditory development are:

- **Detection — “Was there a sound?”**
Detection means your child notices a sound when it occurs. She may or may not know what it is or where it is coming from. Examples of responses that let you know she detects sound are startling and looking up from play.
- **Discrimination — “Is this sound different from another sound?”**
Discrimination means she can listen to sounds and determine whether they are the same or different. It’s fairly difficult to test a child for discrimination until she has already progressed to the next level, which is identification.
- **Identification/recognition — “What is this sound?”**
Identification, or recognition, means your child knows what the sound is and can indicate its source by looking at it or pointing to it. For example, the doorbell rings and she looks to the door. It can also mean that she can accurately label a speech stimulus by pointing. For example, multiple food items are on the table. You say “apple” and she points to the apple.
- **Comprehension — “What is the meaning of this sound?”**
Comprehension means your child can understand some speech by listening. For example, a parent says, “Woof, woof” and the child says “Doggy.” Or a parent asks “Where are your shoes?” and the child says “Outside.”

The Most Important Sound — Talk!

Now is the time to think about listening to voices and talking. Since she will be learning to talk, spoken language is the most important sound for your child to hear. It is believed that when a child listens to speech, specific parts of the brain process that spoken language. But when a child listens to environmental sounds, other parts of the brain process the message. This makes it important for you to provide input of both talk and environmental sounds to develop your child’s listening attention and ability. Remember, your child needs to hear spoken language that is just a bit louder than the background noise. This doesn’t mean you should talk louder, because when we speak in a louder voice, we tend to distort how we speak. The talking should be rich in both pitch and duration. So be expressive to grab your child’s interest. Instead of raising your voice in noisy situations, try to eliminate or reduce the background noise to set up a better listening environment.

Here are some tips to make listening easier and more interesting for your child:

- Be sure the hearing aid, bone conduction device or cochlear implant is optimally set (by your pediatric audiologist).
- Make sure background noise is minimal.
- Speak clearly at close range to your child (1–3 feet) and at ear level if possible.
- Use varying intonation.
- Make your talk interesting, meaningful and fun.
- Associate sound with meaning by using objects, actions, pictures and natural gestures, as needed.
- Provide daily, focused attention to sound and speech.
- Provide lots of input before expecting responses.
- Use the *Techniques to Encourage Talking* in Chapter 13.

Ways of “Giving” Information

During the process of teaching your child to listen and talk, you might hear a few different terms that relate to the way in which you “give” information to your child. Some of the terms used to describe the support or cues you give are:

- Auditory-only — cues your child hears (talking or other sounds)
- Visual — cues your child sees (facial expressions and gestures)
- Auditory-visual — cues your child can hear and see

Auditory-Only Information

One way to develop listening skills most effectively and efficiently is to give your child opportunities to listen without the aid of visual cues. To do this, give auditory-only information. In other words, talk to her without using visual cues. This gives her a chance to learn to understand what you’re saying just by listening. You can easily make conversational talk an auditory-only experience by changing your position relative to your child. If you hold your child on your lap with her facing forward, you are giving auditory-only information. If you sit next to your child instead of across from your child, it’s more likely that you will provide auditory-only information. It’s not recommended to create an auditory-only interaction by blocking your face with your hand or other object because that may distort or interfere with your talk.

The Auditory Sandwich

Other times, your child might not understand an auditory-only cue. This is not uncommon. Even with her hearing devices, your child may not hear perfectly — especially depending on the background noise in the listening environment. Because of this, she might learn to fill in some missing information with visual information. This includes gestures you use, reading lips (or speech reading) and watching the speaker’s face.

If you find your child doesn't understand an auditory-only cue, repeat what you said while adding a visual cue (pointing, showing, etc.). When you see that she understands, repeat what you said once more without the visual cue so your child can practice listening. Always begin and end with auditory-only information to really boost those listening skills. Some people refer to this as an "auditory sandwich."

Over time, you might see your child's listening skills develop more and more. You might notice she is gradually able to understand more without the visual cues, particularly when you're talking about something you talk about every day. This is exactly what you want to see! She is learning to understand through listening alone!

Calling Your Child's Name

To begin encouraging your child to detect speech, call her name to try to get her attention. Do this only in situations in which it's natural and logical to call your child, perhaps as she sees you, perhaps even with your hands around your mouth in a calling gesture. Also do this when you're nearby, but out of her range of vision. This is best done from behind or beside your child, but still from just two or three feet away. Alternate between providing your child a view of you calling her and not letting her see you. Sometimes call her so she sees you, then right afterward repeat the call out of her range of vision. This is particularly helpful for getting your child to focus on the sound of her name. You may do this for weeks or months before your child responds without being able to see you calling. It's critical that you call your child's name only when you actually need her attention. Children are smart, and if you're constantly calling your child's name with nothing to show or tell her, she will lose interest in your voice (sort of like the boy who cried "Wolf!").

Listening Opportunities Throughout the Day

The best times to practice listening are as sound occurs. You don't need a special environment or special activities to show your child the importance and value of listening. Instead, think about making listening a priority throughout the day. Draw attention to the relevant environmental sounds and provide lots of talk. You should even talk at times she can hear you, but not see you. Use the following daily routines as opportunities to provide lots of rich and interesting talk.

■ **When she wants a drink of milk**

An ideal time to give auditory-only information is when your child already gets the idea of your meaning — most specifically, when she wants something. Once you've established she wants milk, say it to her. Say: "Oh, you want milk? I want milk, Mommy." Then, perhaps while pouring it, say "milk" again from beside or behind her, giving her the opportunity to listen to the sound of the word. You can repeat the word again while pointing to the milk.

- **While giving her a banana**

You might discuss the banana she'll eat and talk about it as you peel it. While she listens and looks, you might say "Banana. Here's your banana. Peel the banana. Pull it down. Mmm, banana!" You might then change your position so you're beside or behind her so she has an opportunity just to listen to what you say. You could repeat what you've already said or try something new. You might say "Okay, here's the banana. How about a bite of banana? Do you wanna take a bite? Mmm, banana is so good!"

- **While pushing her in a stroller**

When you're pushing your child in a stroller, lean down and talk to her. This is a very authentic auditory-only situation because it's likely that you are next to your child or above your child, not directly facing her. In this scenario, you can point out an airplane that flies overhead or a lawn mower in the next yard over, all without directly showing your child your face. It's far more natural for you to share a gaze at the sound source than it is to make eye contact and then look back at the sound source.

- **While sharing books**

Make the sounds for pictured items and animals. Get dramatic and use lots of sound effects for actions in the story — the car beeping, the baby crying, the airplane flying, etc. Reading books while holding your child on your lap is a great position to provide an authentic auditory-only interaction. Both of you can see the pictures and share a mutual gaze. Your voice is likely very close to the microphone on your child's hearing device.

- **While playing with toys**

Use sound-making toys and other toys that don't make sounds so you can use your voice to create sound effects. Change your voice when talking to a baby doll, when crashing block towers down or when being dramatic.

- **While cooking**

Cooking offers lots of potential for listening to sounds and words: The blender that goes on and off, the microwave that beeps, the spoon hitting the metal bowl, etc.

- **During routine activities**

Talk as you feed and dress your child. Tell her about your own actions, and give her the words for the actions as she moves and works. Point out sounds like the toilet flushing, the snaps on her onesie as you dress her or even the doorbell if someone comes to your house.

- **While singing and listening to music**

Act out songs, nursery rhymes and finger plays with or without props. Try to use songs or melodic talk while you transition from one activity to another. Make up songs to go with different times of the day (time to go sit down, time to clean up, etc.).

- **During activities that require movement**

Sometimes you just need to get the housework done. At these times and others (such as outside play or yard work), try to take a few moments to notice, point out, highlight and enjoy the sounds that accompany the activity while in close proximity to your child. Consider getting within arm's length for optimal auditory input. Don't forget to squat down to get at your child's level. Remember: Even if you stand next to your child, your voice might be farther away from her ear than arm's length.

Listening Progress

Your child benefits from listening. Eventually, you will expect her to use these skills to demonstrate comprehension of what you say. Some very young children are able to listen without looking at you. They can point to items you name, point to an animal when you've said its sound, indicate different-colored items you describe, and so on. Despite their hearing loss, many children are strong auditory learners; therefore, most of their learning could occur by listening alone.

The Ling Test

Your child's pediatric audiologist or early interventionist may have mentioned something called the Ling Test (Pollack et al., 1997; Sindrey, 2002). Professionals who work with children with hearing loss use a series of six sounds (*ah, oo, ee, s, sh, m*) and later, a moment of silence (starting at about age 3) to determine if a child has access to all the sounds required to listen to spoken language. When you look at a familiar sounds audiogram (see page 58), you will see a shaded area called the speech banana. You may recall that this shaded area visually represents the broad spectrum of speech sounds. As you locate the six Ling sounds, notice that they cross the entire audiogram, indicating that they span several frequencies. These sounds encompass the entire range of frequencies and intensities critical to developing and listening to spoken language. This is handy because when you're on the go with your little one, you can use the Ling test to make sure she has access to both low- and high-frequency sounds as well as sounds that are less intense and more intense.

If you have a baby or young toddler, you're likely responsible for doing your own Ling test many times each day. In the morning before you put the devices on your child, use a stethoset (for hearing aids) or monitor earphones (for cochlear implant microphones) to listen to your child's devices. Say each of the Ling sounds aloud to yourself as you listen. Remember what the sound is like through your child's devices. If, on any day in the future,

Why Is It Called the Ling Test?

Daniel Ling was an audiologist, an educator of the deaf and a pillar in the field of listening and spoken language instruction for children with hearing loss. Dr. Ling described this test as “a simple and effective way of using speech to check whether, in real-life conditions, hearing aids and cochlear implants meet the minimal requirement of providing detectable levels of spoken language . . . over the speech frequency range” (Ling, 2002, page xxiii).

you don't hear one of the sounds, or if any of the sounds seems distorted, contact your child's pediatric audiologist. Keep in mind that when a device starts to act up, it isn't always all or nothing. Certain sounds can become distorted. If you had been checking the device only by saying “Hello. Hello. Test 123,” you might not notice if one frequency is malfunctioning. By using the Ling test, you can isolate specific pitches.

Performing the Ling Test

Ultimately, you will want your child to respond to a standard Ling test in which you say the sounds and your child repeats them. Although a 2½-year-old can usually learn to do a standard Ling test, babies and infants can't. While your child is very young, you can perform two modified versions of the Ling test to ensure she is hearing optimally with her devices. These modified versions include looking for nonverbal as well as verbal responses. You can use these methods as long as necessary, but know that your ultimate goal is to perform the standard version of the Ling test.

Modified Ling Test: Observing Nonverbal Responses

For a baby, you can say the Ling sounds and determine whether or not she detects them. You can learn to recognize certain nonverbal responses, or behaviors, that indicate detection of sound. The steps for performing a Ling test with a baby are as follows:

1. Find a quiet spot where you can do the test without background noise.
2. With the baby facing away from you or at your side (so she can't see your face), say a Ling sound such as *oo*.
3. Look for any noticeable change in behavior in response to the sound.
She may widen her eyes, look around or stop moving or sucking on a pacifier.
4. Respond to her by saying “Yes, that's right! You heard 'oo!'”
5. Touch her little ear and repeat the sound.
6. Repeat this procedure with each of the six Ling sounds: *ab*, *oo*, *ee*, *s*, *sh* and *m*.
7. If your child wears two devices, repeat all six Ling sounds with each device individually.

Modified Ling Test: Using Toys

Once your child demonstrates consistent eye contact and tracking in response to sound, you can teach her to use toys to indicate detection of the Ling sounds. This usually starts around age 2. Young children can learn to throw a block in a bucket, add a piece to a puzzle or put a ring on a peg after hearing each sound. When you initially teach this task, you need to help your child place the toy after the sound is presented. Here are the steps for using toys to perform a Ling test, including the steps for teaching her the task:

1. Find a quiet spot where you can do the test without background noise.
2. Put a toy in your child's hand and hold it up to her ear with your hand over hers.
3. Cue her to listen to you say one Ling sound aloud, such as "oo." After you say it, help her place the toy by moving her hand toward the target and dropping or placing the toy along with her.
4. Fairly quickly, after she catches on to this task, you'll notice that she can manipulate the toys herself without your help. At this point, you can sit next to or stand behind her so your face is not visible as you say a Ling sound. She should respond by placing the toy, but only after you say a sound.
5. Once she has truly learned the task using toys, you can begin each Ling test by placing the toys in front of her and instructing her to "listen." Then sit or stand in a spot where your face is not visible and say each Ling sound, waiting for her to place each toy after each sound. If she places a toy without a sound, remind her to "listen" and start again.
6. If your child wears two devices, repeat all six Ling sounds with each device individually.
7. At this point, you need not expect your child to repeat each sound. The act of placing a toy indicates she heard it.
8. Many children can accurately respond to Ling sounds using toys by age 2½. At this point, you'll also want to teach your child to give verbal responses to simple questions. Ask common questions a child with devices will likely hear often, such as "Can you hear me?" or "Are your hearing aids working?" Help your child respond to these questions so she learns that you're counting on her to respond verbally.
9. Note any difficulty your child has responding to the Ling sounds or the questions you ask. Report consistent problems to your pediatric audiologist.

Standard Ling Test

After the child is proficient at responding verbally to simple questions, you can teach her to respond to the standard Ling test. Again, this is the fastest and most efficient way to determine if her devices are working optimally. It's especially important to do a Ling test first thing in the morning when you put the devices on, whenever you put the devices back on

after removing them or after they fall off, or whenever you suspect a change in the child's responsiveness. The standard Ling test includes all six sounds plus a silence stimulus. Below are the steps for performing a standard Ling test:

1. Find a quiet spot where you can do the test without background noise.
2. If the child wears two devices, put only one on your child, perform the Ling test and then switch. Be sure to perform the test separately with each device.
3. Place yourself next to or behind the child so she can hear you, but can't see your face.
4. Say the following Ling sounds one at a time and teach the child to repeat each sound after you say it. The sounds are *ah*, *oo*, *ee*, *s*, *sh* and *m*. Include a moment when you say nothing and expect the child to respond by saying "Nothing" or "No sound."
5. Each time you perform this test, give the sounds and silence in a different order. If you always say them in the same order, your child might memorize them one way and just repeat them back, without actually listening for a prompt.
6. Use unpredictable intervals between each sound so your child has to respond only after you provide the stimulus (sound or silence).
7. Note any difficulty your child has repeating these sounds back to you with each device. Report any consistent problems to your pediatric audiologist.

Why Does the Standard Ling Test Include Silence?

You may wonder why silence is used in addition to the individual speech sounds. A silence prompt gives your child an opportunity to say she didn't hear a sound so she learns not only to differentiate between different sounds, but also to note accurately when no sound is presented. For example, the *s* sound is one of the softest, and so it's easier to miss. Make sure your child actually is hearing that *s* sound so you know she's hearing really soft speech. Remember, a child needs to be able to hear soft speech to learn to listen and talk. If you say the *s* sound and she doesn't hear it, you're likely to say something like, "Did you hear that? I said 'sssss.'" If this happens a few times, your child will learn that when she doesn't hear your prompt, she should say "*s*" in response. This would make you think she's hearing that sound when really she is not. The silence prompt allows your child to distinguish between no sound and really soft sounds.

The Six Ling Sounds Plus Silence

ahhh



ooo



eeee



shhh



ssss



mmm



silence



The Auditory Hoop

At some point, you may see a professional using something called an auditory hoop to perform the Ling test. This is typically an embroidery hoop with a piece of speaker fabric stretched across it. Professionals cover their faces with the hoop when performing listening tests or when helping a child build listening skills. A hoop allows one to face the child while talking, but eliminates facial cues the child otherwise might see. The speaker fabric allows the professional's voice to remain undistorted. A hoop is a handy device for teachers, therapists and pediatric audiologists to use for performing the Ling test or any other listening activities, but it's certainly not necessary.

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