



Habilitation Outreach for
Professionals in Education

Speech Sounds

A Guide for Parents and Professionals

Nancy Caleffe-Schenck, M.Ed., CCC-A, Cert. AVT® and
Dian Baker, MA, CCC-SLP, Cert. AVT®



Hear now. And always



Speech Sounds

A Guide for Parents and Professionals

Introduction

Plosives and Stops P/B, T/D, K/G

Fricatives H, F/V, S/Z, SH

Nasals M, N

Semivowels W, Y

Liquids L, R

Affricatives CH, J

Introduction

Overview of Speech Sounds

Integration of Audition, Speech, Language, Literacy and Cognition



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Learning to communicate with spoken language is most effective through meaningful and enjoyable experiences that integrate listening, speech, language, reading and thinking. When listening and talking are relevant and positive, spoken communication can emerge in a natural way for children who are deaf.

There is no single method that works best for teaching speech to all children who are deaf, and **Speech Sounds** is simply one approach. It is based on the premise that young children with cochlear implant(s) need to be exposed to all speech sounds through listening as a building block in establishing a strong auditory foundation.

Speech Sounds consists of units for 20 English consonant sounds. Each card condenses a relatively large body of information into manageable units to easily incorporate speech into everyday experiences and books. It is used in conjunction with specific language goals from a child's individualized treatment plan. Optimally a family is working in partnership with a therapist or educator for auditory habilitation. A child's progress is related to a strong link among home, daycare, school and therapy and the child's interactions with everyone in these settings.

Each **Speech Sounds** unit focuses on one speech sound and incorporates

- Child-friendly words
- Daily routines
- Activities
- Games and toys
- Songs, rhymes and fingerplays
- A popular children's book
- Additional books



How to Use **Speech Sounds**

Speech Sounds is used as a supplement to the developmental way children who are deaf learn speech sounds through listening. The units serve as a guide to professionals for planning therapy sessions and classroom activities. Parents use the overview and the cards as a resource for active and effective home carry-over.

Planning and Preparation

First, download the **Speech Sounds** units from the HOPE area of the Cochlear website at www.cochlear.com/HOPE. Next, gather and organize props, toys and books into containers. Ideally, professionals and parents will obtain materials for a particular sound several weeks prior to its use in therapy or in the classroom allowing enough time to order books from the library or on-line and to gather props for upcoming activities. Many of the same props may be used with different units. Good places to find materials at reasonable prices are on the Internet (see resources below) and at garage sales or hobby, toy, and party supply stores. You can also find all of the books on the Internet. Be creative. Find common objects in your home and classroom or clinic. Have a treasure hunt with the child to find or create materials. Make note cards and put them in appropriate places around the house or classroom as a reminder of the vocabulary and language to reinforce.

When to Begin

Speech Sounds is intended to be used with younger children ages 1 through 5 years, but can also be adapted for older children. Prior to embarking on this adventure, a child should have an auditory foundation and be able to:

- Listen, attend to, and discriminate if sounds are the same or different
- Vocalize suprasegmentals: rhythm, duration, pitch and intensity
- Produce vowels
- Attach meaning to animal and/or vehicle sounds
- Imitate vocalizations on request
- Understand and use a few functional words, such as "bye bye," "more," "all gone" with the appropriate suprasegmentals and vowels, but not necessarily correctly produced consonants.

What to Do

The focus is on teaching speech through listening to maximize a child's auditory potential or auditory self-monitoring of speech. The process is as important as the content. Listening is a cognitive process and our job is to stimulate a child's brain so he can understand what the ears hear. Follow the **5 E's** (Caleffe-Schenck, 2007) as you highlight sounds through spoken language and weave them into daily routines, children's literature, activities, games and toys:

- **Expose** a child to a sound or word(s) using auditory input only. Begin by babbling the target sound coupled with either the vowel "ah" or "oo" or "ee", such as "bah bah bah". Extend this to words and phrases rich in the targeted sound. Present the model through listening first, before the child sees the toy or prop or cue. This sets the stage for a child to listen with intent and to establish an "auditory impression" of the target sound that will assist in recall in the future. As soon as a child produces a sound with consistency, discontinue the babbling and continue to encourage carry-over into spontaneous language. From then on, babbling is used as a remediation strategy to acoustically highlight a sound if it is incorrectly produced in some context.
- **Expect** the parent, then the child to imitate or respond verbally. This completes the auditory self-monitoring loop and encourages active rather than passive listening.
- **Experience** a toy, book or activity that represents the sound or word. This is a child's opportunity to relate to the toy, book or activity and enjoy the process in a meaningful way. It keeps a child interested and encourages carry-over into the real world. It is also an important step in taking a child quickly from imitation to thinking and auditory processing and understanding.
- **Expand** on the language model and the child's communication. The adult's verbal input should be at a level slightly higher than a child's spontaneous expressive language to establish the foundation for future progress.
- **Expressive** spoken language emerges later in time when a child spontaneously uses the sound or words with symbolic meaning in the real world.

Where to Begin

There is no specific order for the sound units. There are some general guidelines to help you choose the sequence of sounds for any individual child. Start with consonants a child is already producing. Then proceed by following the normal order of development of speech sounds. Earlier developing sounds, not in specific order, may include: m, b, y, n, w, d, p, h. Take into account the acoustic characteristics of each sound relative to what a child hears. Also consider that the most frequently occurring manner of phonemes is plosives and stops, or p, t, k, b, d, g, although "s" is the specific sound most often used by English speakers. Consider the sounds a child uses frequently which are highly motivating, such as sounds in his name or sounds in his favorite foods.

Overlap among units is expected. A variety of sounds, in addition to the target sound, will emerge naturally as a child's auditory self-monitoring develops. It is important to individualize the program based on each child's progress. Develop strategies based on diagnostic teaching, such as, alternating consonants within manner from sounds the child has acquired and babbling nonsense syllables related to words and phrases from real life situations.

What to Expect

The purpose of **Speech Sounds** is to "bathe the child in sound" (Pollack, Caleffe-Schenck, Goldberg, 1997) to stimulate natural development of speech through listening. Provide rich auditory input and exposure for one sound, and then move to a different sound after one or two weeks. Typically a child will show understanding (reception) prior to using the sounds and language (expression).

Initially there is not an expectation for perfect speech. Speech development is a process and emerges over time. A child's imitations will give adults information about what the child hears, his depth and confidence in listening, need for reprogramming of his cochlear implant speech processor(s), the amount of exposure he has had to the sound, oral-motor development and/or motivation. Imitation is highly dependent upon motivation, so a child must be stimulated with interesting daily activities. Analyze the reason for a child's errors to determine future goals and recommendations. Be aware that a child's production of sounds at this stage may come and go as the emphasis on one consonant over the other changes.

Over time, correct productions are encouraged and expected. The expectation for correct speech should be based on the ages and progression of speech development for children with normal hearing. If a sensory or motor delay is suspected, make appropriate referrals to an occupational or physical therapist who specializes in this area. If a child has had sufficient time and experience in learning a **Speech Sounds** sound through listening and still does not approximate the sound or word, it may be appropriate to use the strategy called "the auditory sandwich" where a child is exposed to an auditory presentation three times followed by a visual or tactile cue and then again through listening alone.

Tracking Progress

Monitoring a child's progress is an important aspect of any program. It is the responsibility of professionals to coach parents to be positive and effective spoken language models in their child's natural environments. Parents should take an active role by:

- Reading daily to their child and discussing what they have read
- Targeting and teaching vocabulary from each unit in a variety of meaningful contexts
- Tracking their child's progress
- Reporting back to professionals on a consistent basis

Each **Speech Sounds** unit provides an easy and time-efficient way to maintain consistent and accurate records of progress.

Place a dot (•) in front of a word or an activity after you have presented it to a child. To monitor speech development, circle a word when the child correctly says the targeted sound in the word. Vocabulary development is tracked by putting a dash (—) by the words a child understands and a plus (+) by the words a child says spontaneously.

How Speech Sounds Works

The Listening-Talking-Reading Connection

We learn to talk by saying what we hear and hearing what we say. This is termed the “auditory self-monitoring loop” or “auditory feedback loop.” It is the avenue through which children develop sounds and learn the language of their culture. Children who are deaf are capable of developing natural sounding voices and spoken language when they learn speech through listening rather than looking. Too much emphasis on visual cues may lead to unnatural sounding voice quality and exaggerated speech. A child’s ability to develop natural and intelligible speech is related to early detection and intervention, use of appropriate and optimal technology such as cochlear implant(s), establishing a strong auditory foundation by learning to listen, integrated sensory and motor systems, consistent exposure to spoken language, and parent or caregiver participation. Communication among a child’s cochlear implant audiologist, teacher or therapist and parent is important for maintaining optimal programming of the cochlear implant(s).

With individualized modifications any child may benefit from **Speech Sounds** for remediation. Even though it is difficult to change voice quality, articulation can be corrected even for older children. The process and materials may be helpful for older children who receive a cochlear implant(s); children who use sign language or other visual systems to communicate; children learning English as a second language; children with normal hearing who have auditory processing, articulation and/or language delays; and children learning to read.

Speech Sounds facilitates phonological awareness for reading as well as reading comprehension. Reading aloud to a child on a daily basis strengthens the connection of listening and talking with reading. A robust receptive and expressive vocabulary is necessary for proficiency in communication, reading and writing.

Phonological Development

A child with normal hearing typically develops speech in a predictable manner. Young children with hearing loss usually learn in the same developmental way as normal hearing children if they have a strong auditory foundation, no additional challenges, and access to learning speech through listening during the early speech development period.

Speech Sounds is based on typical development where the normal progression is: vocal play, suprasegmentals, vowels, and consonants. It encourages development at the phonetic level where a child imitates sounds or uses echolalia, and sets the stage for a child to begin babbling. Babbling progresses beyond simply imitating sounds to linking sounds with meaningful language, conversation, literature and eventually reading.

Speech Acoustics

Since the basic premise of **Speech Sounds** is that a child learns speech through listening, it is fundamental to consider the basics of speech acoustics. Every speech sound has concentrations of acoustic energy called formants that make it different from other sounds. Although the same sound is pronounced slightly differently based on the sounds that precede or follow it, in general, the acoustic properties of a sound are consistent. Understanding of speech acoustics assists professionals and parents in establishing realistic and systematic goals, reinforcing appropriate approximations of speech, and optimizing a child’s auditory potential with the use of appropriate technology.

Manner of production is **HOW** a sound is made. **Speech Sounds** cards are color coded according to the manner of the sound. Listed below are the different manners, basic definitions, consonants and the cards’ color code for each manner of production:

- **Plosives and stops:** a release of built up air pressure occurs with plosives; the pressure is not released for stops.
p/b, t/d, k/g — **green tabs**
- **Fricatives:** a point of constriction causes friction in the breath stream that creates a sound. **h, f/v, s/z, sh** — **blue tabs**
- **Nasals:** the breath stream goes mainly through the nose.
m, n — **purple tabs**
- **Semivowels:** produced like vowels except there is greater constriction. **w, y** — **yellow tabs**
- **Liquids:** the tongue diverts the breath stream in the mouth. **l, r** — **orange tabs**
- **Affricatives:** a stop is released with a fricative. **ch, j** — **red tabs**

Place of production is **WHERE** a sound is made. Listed below are the different places, basic definitions and the consonants within each place of production:

- **Bilabial:** two lips. **p, b, m, w**
- **Labiodental:** bottom lip and teeth. **f, v**
- **Linguadental:** tongue and teeth. **TH, th**
- **Alveolar:** ridge on hard palate behind the upper teeth. **t, d, s, z, n, l, r**
- **Palatal:** hard palate. **sh, zh, y, ch, j**
- **Velar:** back of soft palate. **k, g, ng**
- **Glottal:** back of mouth. **h**

Manner of production is easier to hear than place of production. For example, /b/ is a plosive and sounds very different from /m/ which is a nasal. Interestingly, /b/ and /m/ look the same through lipreading because they have the same place, bilabial. This is why sounds that have the same place of production may be confusing to a child who relies on lipreading to learn speech. A child is relying more on auditory cues when he substitutes sounds that are within the same manner of production, such as saying /p/ for /t/ or /k/ or saying /s/ for /f/ or /TH/.

Voicing indicates whether a sound is made while the vocal folds are vibrating or not vibrating. Most sounds are grouped in pairs where one sound is made with voice and the other sound is voiceless. With lipreading they look the same, so again these sounds can be confusing to a child who relies on looking rather than listening. It is much more effective to use listening rather than looking for discrimination of voiced versus voiceless sounds. Listed below are the consonants pairs for voiced and voiceless phonemes:

	VOICELESS VOICE OFF	VOICED VOICE ON
Bilabial	p	b, m, w
Labiodental	f	v
Lingua-dental	TH	th
Alveolar	t	d
	s	z
		n, l, r
Palatal	sh	zh
	ch	j
		y
Velar	k	g, ng
Glottal	h	

Completing Speech Sounds

It can take 20 - 40 weeks to cover the 20 **Speech Sounds** units depending on whether you spend one or two weeks on a sound. Sometimes it is appropriate to cycle back through the sounds a child is not consistently producing correctly. Remember that **Speech Sounds** is based on teaching sounds and spoken language through listening, so it is important to integrate appropriate and progressive language and communication goals into all activities.

Primary References

- Caleffe-Schenck, N. Two (One-Hour) HOPE Online Seminars available free at www.cochlear.com/HOPE
 - Sound Speech for Speech Sounds (2007)
 - More Sound Speech for Speech Sounds (2007)
- Pollack, D., Goldberg, D., Caleffe-Schenck, N. (1997) Educational Audiology for the Limited-Hearing Infant and Preschooler: An Auditory-Verbal Approach (3rd Edition). Springfield, IL: Charles C Thomas.

HOPE Resources from Cochlear Americas

- There are many HOPE Online seminars — archived and live — that support auditory learning strategies. Review the listing at www.cochlear.com/HOPE. Three archived seminars that are especially relevant:
 - Goldberg D (2007) Working with Babies: What to Do before the Cochlear Implant
 - Therres MK (2007) Learning to Listen and Starting to Speak: Developing Auditory/Oral Skills in a Child with Hearing Loss
 - Nevins ME & Garber A (2007) HOPE Tips: Therapy Ideas for Preschoolers

- *Educator's Guide*. Download a copy at www.cochlear.com/HOPE
- *Getting Started: Practical Tips for Parents*. Free booklet available from Cochlear Americas
- *Start Listening: A Guide to Hearing Habilitation*. DVD from Cochlear Americas
- *HOPE Notes* (18 individual Notes) Download a copy at www.cochlear.com/HOPE
- *Listen, Learn and Talk* includes a booklet providing a comprehensive scale for assessing progress and DVDs demonstrating therapy ideas www.cochlearamericas.com

Selected References from AG Bell

- Alexander Graham Bell Association for the Deaf and Hard of Hearing, Washington, DC. www.agbell.org
- Estabrooks W, Editor (1998) *Cochlear Implants for Kids*.
- Estabrooks W, Editor (1994) *Hear & Listen! Talk & Sing!*
- Estabrooks W, Editor (2003) *Songs for Listening! Songs for Life!*
- Ling D (2002) *Speech and the Hearing-Impaired Child*.

Other Useful Resources

- Gebers JL (2003) *Books are for talking, too!* Austin, TX: PRO-ED.
- McCord S. *The Storybook Journey* video series. www.landlockedfilms.com
- Picket JM (1999) *The Acoustics of Speech Communication: Fundamentals, Speech Perception Theory, and Technology*. Boston: Allyn and Bacon.
- Wee Sing CDs. #1 Around the World, #2 Nursery Rhymes and Lullabies, #3 Sing and Play, #4 Sing-Alongs, #5 For Baby, #6 Games Games Games, #7 Animals Animals Animals, #8 Fun 'n' Folk, #9 25th Anniversary Celebration.

Internet Sites

www.Amazon.com
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Special thanks to Donna Sorkin, Warren Estabrooks, Todd Hallberg, the Rech family, Marsey Robben, Amy Schenck and the Winkler family for their editing comments.