Rady Children's San Diego
Audiology Department

Parent Packet

NEWLY IDENTIFIED HEARING LOSS

Rady Children's Health

Index

After the Diagnosis

Most parents are not expecting to be told their child has atypical hearing. Some parents are shocked, confused, angry, or even feel guilty. Each family receives this news differently. Often, people in the same family have different feelings. It is common for family members to have different feelings. Your family might want to talk to someone who is trained to help families learn about and share their thoughts and feelings. This person might be a counselor, social worker, clergy, teacher, service coordinator, or any other person that is trusted by your family. You will need to process how you are feeling about this news. Making decisions that are right for you and your family can be hard. Professionals and other people and groups can help you look at all the different choices. But you are the final decision maker. You know your family and child better than anyone else.

Gathering Information

Most families will want to learn more about their options. You will begin to gather information. You might be ready to make decisions from what you already know. Know that you will continue to gather information as your child grows. Your choices of options will change over the years. Think of gathering information as a journey. You can get information from audiologists, teachers, therapists, and otorhinolaryngologists (ENTs).

Another great source of information are community support networks. Parents and children in the DHH (Deaf/Hard of Hearing) community are an invaluable resource through this process and can help build confidence in your child's abilities. It is also important for your child to interact with other children with atypical hearing to show them that they are not alone and to foster a positive self-image. There are many ways we can assist in finding opportunities to network with the DHH community, just ask us! Of course, the internet also has a lot of information. We can see some of these resources on our website. (http://www.rchsd.org/programs-services/audiology-hearing/resources).

Can't I just wait? Why do I need to make choices now?

The months ahead will likely feel like a whirlwind, but they are vital in setting your child up for success. The first year of your child's life is crucial for their long-term development. We want to try to identify hearing differences as early as possible. We want to provide early treatment options. We know that the brains of young children develop as they hear, see, and experience the world around them. This means, we want them to have access to language as early as possible. Sometimes there are delays. But the sooner we provide language, the better. There are many ways of providing language. Some of the most common are listening and spoken language (LSL), sign language as a first language (ASL) or bilingual-bimodal (BiBi). In another section we provide more information about this. Once you pick the language input of your choosing, we can begin providing services. When choosing, ask yourself:

- What level of hearing difficulty does my child have now? Will this change?
- Does my child have any additional needs? Will one way be more suitable?
- What support will my family and I need to learn to communicate? Do we have access to that support?
- What new skills will we have to learn as a family? Can we commit to that?

- Can I get the support I will need in my area? Will I need to travel?

While overwhelming, it is important that you soon transition to action mode and become a strong advocate for your child's care. We have access to technology, therapies and resources that have been proven to help deaf and hard of hearing children accomplish more than ever before. Let the needs of your child guide your choices. We will try to help you with this decision. We can tell you which communication opportunities exist in your area. We can help you If your preferred communication opportunity is not available in your area. We can pair you with parents to talk to who have gone through the process. We can give you ideas of how to get the support and information you need.

The importance of identity for Deaf and Hard of Hearing Children

Identity is formed from a combination of memories, experiences, relationships, and values. The most important stage of identity development is childhood/adolescence. This means that your child's positive identity around how they hear starts with YOU. We know that children who view their hearing difficulty as a positive part of their identity are more likely to self-advocate and have strong peer-to-peer relationships. Recognizing that their hearing difficulty is a part of your child's identity will also help your child to be confident and proud of who they are.

Foster positive self-image from the start

Your child will learn how to feel about their hearing from you. It is vital to discuss their feelings openly and without judgement or shame. Negative beliefs towards atypical hearing abilities/hearing aids/cochlear implants can be interpreted by children as judgment towards who they are as a person. By embracing your child's hearing difficulty, you are empowering your child to love themself as they are. Some ways to foster positive self-image in your child may include:

- Celebrating your child's milestones and wins
- Exposing your child to DHH role-models in books, movies, etc. (see the resource section for recommended examples)
- Don't underestimate what your child can accomplish
- Include other family members (siblings, grandparents, etc.) in the journey. Educate them on how to support your child and communicate most effectively
- Consider letting your child (or their siblings) choose their hearing device colors
- Avoid getting frustrated or using phrases like "never mind" or "it wasn't important" with your child if they didn't hear you. This can result in the child feeling excluded or devalued.

What can you expect from us?

Our team will provide you with information on options. These options may include hearing aids or cochlear implants. We will provide you with information about communication options that you can choose. We can help make referrals and connect with early intervention/educational resources. You have many people/resources to help you on your journey to parent your child. We are going to be there with you as you embark on this new journey!

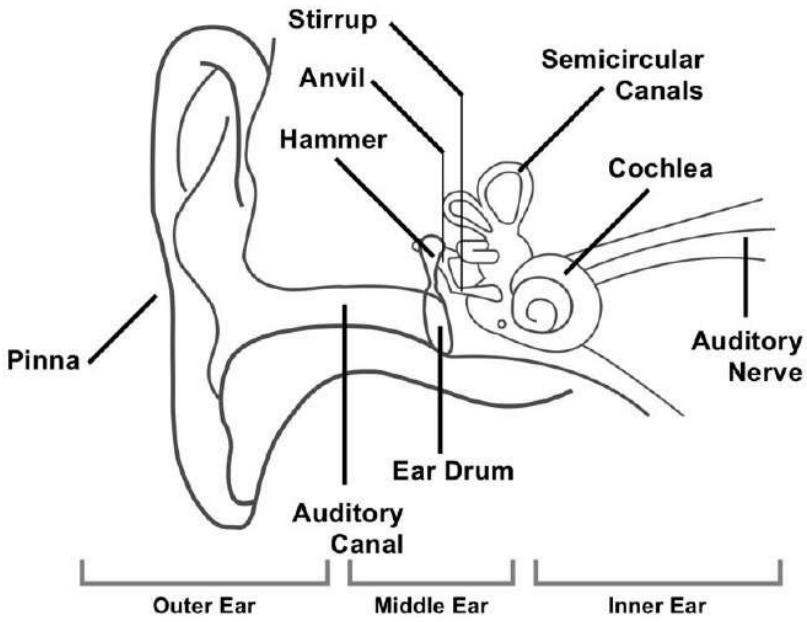
All About Hearing

How We Hear

The ear has three parts: outer, middle, and inner ear. Each part helps in the transfer of sounds to the brain. If a section does not work as expected, it can cause a hearing difference.

The OUTER EAR has two parts: the ear canal and the eardrum. Sounds, in the form of sound waves, enter the ear canal. They travel the length of the ear canal and reach eardrum. Sound waves bounce off the eardrum. This causes the eardrum to vibrate.

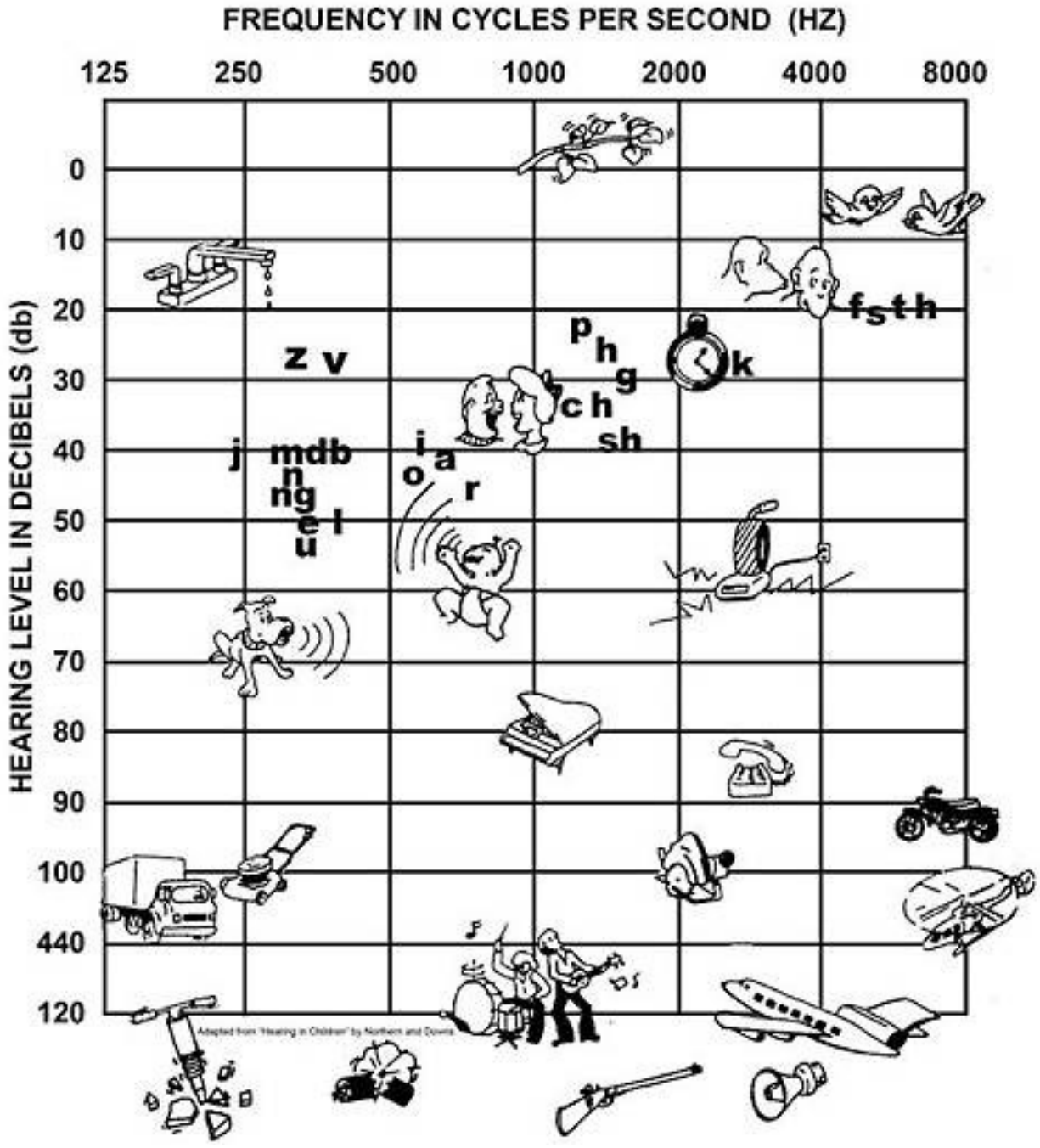
The MIDDLE EAR is an air-filled space. The eardrum on one side and the cochlea on the other. There are three bones in the middle ear. These form a bridge between the eardrum and the cochlea. The place the bones connect with the cochlea is the oval window. When the eardrum vibrates, the bones transfer this vibration to the oval window. Vibration of the oval window causes the fluid in the cochlea to vibrate.



Movement of the fluid in the INNER EAR causes the hair cells in the inner ear to create an electrical signal. The signal is then sent up the auditory nerve to the brain. The brain processes these electrical signals. This is how we “hear” the sound.

How to Read an Audiogram

An audiogram is a graph we use to describe hearing levels. When looking at an audiogram, from left to right you will see frequencies/pitches. On the left side are low pitches and on the right are high pitches. Pitches are measured in Hertz (Hz). From the top to the bottom, you will see Intensity/volume. Soft sounds are at the top and loud sounds at the bottom. Loudness is measured in decibels (dB). A symbol is placed on the audiogram at each pitch for the softest level that your child responds to.



Degrees of Hearing Differences

Audiologists will also talk about the hearing differences. We use a scale that includes catagories of typical, slight, mild, moderate, moderately-severe, severe and pround. The chart below describes what each of these catatories means for hearing sounds. We know that this is complicated. Not every noisy place is the same. Not every school classroom the same.

Hearing Threshold Difference Description	Impact on detecting spoken language
Typical Hearing -10 – 20 dB HL	A child with typical hearing will be able to know that soft speech exists. Children with typical hearing might have difficulty understanding speech in noisy settings.
Slight 21-25 dB HL	A child with slight hearing thresholds, may have difficulty hearing soft speech or speech from a distance. If more than 3 feet from a teacher or in a noisy classroom, the student could miss some of what the teacher says.
Mild 26-40 dB HL	A child with mild hearing thresholds can miss half of what is said in class if not looking at the speaker or if speech is soft. A mild hearing difference can have serious effects on speech and language development.
Moderate 41-55 dB HL	A child with moderate hearing thresholds, can often understand face-to-face conversation in quiet. They will struggle when they can't see or are further away from the speaker. Without a hearing device, a child can miss 80-100% of spoken language.
Moderate-to-Severe 56-70 dB HL	A child with moderate-to-severe hearing thresholds will have difficulty understanding spoken conversations without hearing aids/cochlear implants. They will miss almost all spoken speech information.
Severe 71 – 90 dB HL	A child with severe hearing thresholds will only detect the presence of speech if the speaker is speaking loudly and is close to the child. Visual communication systems (ASL) or cochlear implants are often recommended.
Profound 91 + dB HL	A child with profound hearing thresholds will not hear loud speech or environmental sounds. Most children will rely on vision rather than hearing. Visual communication systems (ASL) or cochlear implants are recommended.

Types of Hearing Differences

There are four types of hearing differences. They are conductive, sensorineural, mixed, and auditory neuropathy spectrum disorder (ANSD). CONDUCTIVE HEARING DIFFERENCES are when sound cannot travel throught the outer or middle ear. Some of these differences can be medically treated. Some of the most common reasons for a conductive difference are:

- Ear wax
- Fluid or infection in the middle ear
- Hole in the eardrum

- Outer or middle ear not formed correctly
- Bones in the middle ear are broken or fused together
- Foreign body in the ear canal
- Growth in the ear canal (exostosis) or middle ear (cholesteatoma)

SENSORINEURAL HEARING DIFFERENCES mean that sound does not travel in the inner ear or along the auditory nerve as expected. We can assist most sensorineural hearing differences with a hearing aid or cochlear implant. However, we cannot medically treat it.

Hearing differences can also be MIXED, meaning they are partially conductive and partially sensorineural.

Another less common type of hearing difference is auditory neuropathy spectrum disorder (ANSD). With this type of hearing difference, signals leaving the inner ear may be disorganized or the hearing nerve may not process sound as expected. With auditory neuropathy, hearing differences can range from mild to profound and can fluctuate.

For hearing differences in children, we often try to determine when the difficulty started. A difference present at birth is called *congential*. If not present at birth, we call the difference *aquired*. We also try to determine the cause of the hearing difference. We know that 50% of all childhood hearing differences are due to genetic factors. There is a chance that the reason for the hearing difference will not be something we can pinpoint.

The most common reasons for a child having a CONGENITAL hearing difference include:

- Genetic factors
- A condition/syndrome that has hearing difficulties associated with it
- Physical abnormality of any part of the ear
- An unexpected event occuring during pregnancy

Some of the most common reasons for a child to have an ACQUIRED hearing difference include:

- Complications at birth
- Jaundice
- Illness such as meningitis, scarlet fever or mumps
- High fever
- Neurodegenerative disorders
- Ototoxic medications
- Head injury or trauma
- Repeated or constant ear infections
- Long-term exposure to very loud sounds

Some common causes for a child to have ANSD include:

- Malformed inner ear and/or small auditory nerve
- Hereditary/Genetics
- Lack of oxygen at birth
- Hyperbilirubinemia requiring blood transfusion, associated with severe jaundice
- Immune disorders
- Neurological disorder
- Infectious disease such as mumps

Genetic Hearing Differences

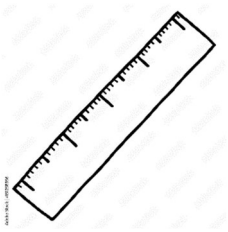
Genetic hearing differences means that the hearing difference is passed on through the family. There are two types of this type of hearing difference: syndromic and non-syndromic. Syndromic means that there are other concerns in addition to the hearing difference. Non-syndromic means that the hearing difference is the only concern for the child. The most common type is a non-syndromic hearing difference.

Half of childhood hearing differences that are genetic. Of those about 70% are what we call recessive. This means that we only get that kind of difficulty if both parents carry that gene. One gene, known as Connexin 26, makes up about 1/3 of all genetic hearing differences. We recommend genetic testing because so many hearing differences are due to genetics. Genetic testing can help identify the cause of the hearing difference. It also helps us to know what to expect in the future so we can better plan for your child. The table below gives information about the most common genetic hearing differences:

Syndrome	Main Feature
Alport	Hearing difference may be sensorineural, conductive, or mixed. The difference can be progressive. Other features include kidney problems, near-sightedness or cataracts, and palate abnormalities.
Brachio-oto-renal	Hearing difference could be conductive, sensorineural, or mixed. Cysts (or pits) can be found on the neck or in front of the outer ear. The outer ear may be malformed. Kidney problems can be serious.
Charge	The hearing difference maybe be sensorineural or mixed. The degree can be mild to profound. Other features can be partial facial paralysis, cleft palate, cleft lip, kidney problems, and feeding problems.
Jervell and Lange-Nielsen	Hearing difference is sensorineural. Children can also have an abnormal heart rhythm. This can cause fainting spells and even death if not treated. Medication can help treat the abnormal heart rhythm.
Neurofibromatosis type 2	Hearing difference is sensorineural due to tumors of the hearing and balance nerve. Coffee with cream-colored spots or freckling can be seen on the skin. Other features are cataracts.
Pendred	Hearing difference may be mixed or sensorineural. It might be progressive. Abnormal inner ear anatomy and thyroid enlargement can be another feature.
Stickler	Hearing difference is usually conductive but can be mixed or sensorineural. It is often progressive. Unusual facial features, cleft palate, eye problems, and arthritis are common.

Treacher-Collins	Hearing difference is conductive. Usually this includes cleft palate, down-slanting eye-slit openings, unusual pupil openings, under-developed cheek bones, absent/malformed outer ears, and teeth alignment problems. Balance problems can also be another feature.
Usher	There are three types of Usher syndrome. Each as a different amount of hearing difference. All are sensorineural and have vision loss. Balance problems can also be another feature.
Waardenburg	Hearing differences can be in one or both ears. This is always a sensorineural difference. The most common features are premature graying hair, white forelock, fused eyebrows, and skin pigment change.

Developmental Milestones: Birth to Eight Years



Children grow and develop at different rates. However, most follow an expected developmental path. This path is defined by developmental milestones. They start out as simple and build on each other. They should occur at predictable times. For example, a child first babbles single syllable words before two syllables words. They babble two syllable words before speaking two-word sentences. The Milestone charts give a "timetable" for when children begin to mater these skills. Remember, an individual child may develop more quickly in one area than in another. Below are guidelines for hearing, speech, language and cognition (Please note that children using ASL as their mode of communication may follow a different path which includes visual communication milestones.) Most children using listening and spoken language will demonstrate these skills within six months of the times listed.

Birth - 3 Months			
Hearing	**Speech**	**Language**	**Cognition**
Auditory detection/attention: • Reacts to loud sounds with startle (Moro reflex) • Reacts initially to sounds that are close by; between 2-4 months begins to develop distance hearing • Responds to LF sounds (vowels) better than to HF sounds (consonants) • By the end of the third month, an infant recognizes his mother's voice; stops crying to listen; listens to his/her own sounds • Enjoys only a few noisemakers	• Infants are unable to control motor movements; therefore, most actions are reflexes. The most important reflex for speech development is the rhythmic suck swallow pattern, established three months prior to birth. • Produces sounds such as fussing, crying, burping and cooing. • Produces most sounds on exhalation with lengthy vowel-like sounds (back vowels) • Makes single vowel sounds "ah" "eh" "uh" - one syllable • Sustains cooing 15-20 seconds • Different kinds of crying for pain and hunger	• Attends to speaker's mouth or eyes • Moves in response to voice • Expresses feelings by cooing (one syllable - "ah"), gurgling (at back of throat) and crying (E) • Exhibits differentiated crying (E) • Vocalizes to caregiver's smile and voice and to express pleasure (E)	• Responds to and imitates facial expressions of others (Meltzoff & Moore, 1977) • Recognizes bottle or breast • Briefly looks at objects

4 - 6 Months			
Hearing	**Speech**	**Language**	**Cognition**
• Turns eyes/head to search for sounds • Enjoys hearing own sounds (gurgling, laughing and babbling), auditory feedback loop develops • Enjoys sound of musical toys (rattles, bells) • Responds to voices by babbling	• Vocalizes in self-initiated sound play • Coos to music • Vocalizes "ma" or "mu" • Tries to repeat heard sound sequences • Babbling begins • Experiments and plays with sounds (yells, gurgles, blows raspberries and bubbles)	• Smiles at speaker (R) • Vocalizes to objects (E) • Laughs • Says "mama/dada" without meaning (E) • Babbles to gain attention (E) • Shows pleasure/displeasure by vocalizing (E)	• Explores with hands and mouth • Smiles/vocalizes to mirror image; reaches out to mirror image • Experiments with cause-effect: shakes rattle • Reaches for objects

• Begins differentiating between environmental and speech sounds • After hearing the mother's voice, cries if the face he/she then sees is not the mother's face • Recognizes familiar sounds for feeding (e.g. a spoon in a dish)	• Varies volume, pitch and rate (suprasegmentals)		

7 - 9 Months			
Hearing	**Speech**	**Language**	**Cognition**
• In sitting position, turns eye/head/body to source of sound (sound localization); has difficulty locating sounds above or behind • Responds to simple requests • Modifies speech to match what is heard • Imitates speech and non-speech (blowing raspberries) sounds • Responds to name • Attends to music/singing • Understands many onomatopoeias (Learning to Listen Sounds)	• Produces sounds in one breath • Enjoys imitating sound sequences • Babbles with some CV syllables ("bababa") • Uses /m/, /n/, /b/, /p/, /t/, /d/ in babbling • Imitates sounds, cough, tongue clicking (increased tongue tip activity), etc. • Imitates some onomatopoeias • Babbling shows pitch and inflectional changes • Copies (sometimes inaccurately) intonational contours • Beginning of adult speech (starting to develop certain vowels, syllables, diphthongs)	• Recognizes names of family members (R) • Responds to "no" most of the time (R) • Attends to pictures (R) • Uses gesture and vocalization to protest (E) • Vocalizes during games (E)	• Searches for partially hidden object • Struggles to get objects that are out of reach • Plays games like "peek-a-boo" • Imitates simple acts, e.g. clapping, nodding • Gives, points, shows • Pulls rings off peg

10 - 12 Months			
Hearing	**Speech**	**Language**	**Cognition**
• Responds physically to music • Responds to questions by searching • Can look for named object that is out of sight • Understands some common phrases	• Uses variegated (nonreduplicative) babbling ("dageedagee") • Begins changing babbling to real words • Continues imitating sounds • Begins using more back vowels, central vowels and consonants	• Recognizes familiar persons or objects when named (R) • Looks at named pictures with an adult (R) • Attends to new words (R) • Identifies 2 body parts on self (R) • Gives objects upon verbal request (R) • Uses social gestures (waving "bye-bye") (E) • Vocalizes with intent frequently • Uses onomatopoeias to refer to objects (E) • Says one to two words spontaneously	• Tries to accomplish simple goals (seeing and then crawling to a toy) • Looks for/finds objects that are out of sight (such as a spoon that falls under the table) • Stacks rings on peg • Begins awareness of in/out (objects/containers)

12 - 18 Months

Hearing	Speech	Language	Cognition
• Shows interest in sounds of radio and television • Listens to simple stories, songs and rhymes • Demonstrates two item memory	• Uses echolalia and unintelligible speech/jargon • Omits some initial consonants and almost all final consonants • Continues to develop vowels and diphthongs • Varies pitch when vocalizing • Uses 21 different phonemes • Imitates words inexactly	• Follows 1-step commands without a gesture/verbal cue alone (R) • Uses true words within jargon-like utterances (E) • Combines vocalizations and gestures to obtain a desired object (E) • Identifies/points to 3+ body parts (on self or doll), clothing item or toy on verbal request • Names objects on request (E) • Gives objects if asked (R) • By month 18, uses 20-100 meaningful words; 50% of words are nouns (E)	• Explores objects in many different ways (shaking, banging, throwing, dropping) • Points to named pictures • Begins to use objects correctly (drinking from cup, brushing hair, holds phone to ear) • Laughs at silly actions (as in wearing a bowl as a hat) • Solves problems by trial and error (e.g. inverts bottle to obtain object; obtains toys with stick) • Scribbles spontaneously

18 - 24 Months			
Hearing	**Speech**	**Language**	**Cognition**
• Understands when called from another room • Remembers what was heard in the correct order (e.g. “Put the fish in the water and the turtle on the grass.”) (auditory sequencing) • Follows a conversation when the topic is known • Answers questions about a picture or book	• Jargon peaks at 18 months • Correctly pronounces most vowels • Uses /m/, /p/, /b/, /w/, /n/, /t/,/d/ correctly in the beginning of syllables and short words • Two years: 25%-50% intelligibility • Commonly uses 25 different phonemes • Uses beginning consonants • Word-final consonants emerge • Pitch is lower and more stable	• Follows 2-step related commands without visual cues (R) • Points to 4+ body parts (on self or doll) (R) • Uses question intonation to ask yes/no questions (E) • Uses 2-word phrases/sentences frequently by 24 months (“more milk,” “a doggie,” “read book”); MLU 1.5-2.0 (E) • Names most common objects (E) • Understands questions “Where?” and “What’s that?” (R) • Begins using pronouns like “my,” “me,” “mine,”; refers to self by name (E) • Uses 200+ words (E)	• Finds objects even when hidden under 2-3 covers • Likes to take things apart • Stacks rings on peg in order of size; builds higher towers • Turns one page at a time • Activates mechanical toy • Pretends plays about familiar situations

2 - 2½ Years			
Hearing	**Speech**	**Language**	**Cognition**
• Answers questions about a story	• 60% of speech is intelligible by 30 months of age • Continues to develop front consonants	• Responds appropriately to location phrases (“in”,“on”) (R) • Recognizes family member names (R) • Uses “and” (“mommy and daddy”) (E) • Uses 3-word sentences frequently; MLU 2.0-2.5 (E) • Begins using verb endings (-ing) (“Mommy pushing”) (E) • Refers to self as “me” rather than by name (E)	• Begins to sort by shapes and colors • Names one color • Begins make-believe play; dramatizes mother and baby • Begins to understand functional concepts of familiar objects and part/whole concepts • Shares toys

		• Asks simple questions ("Where ball?" "What Daddy doing?" "What color?") (E) • Uses number + noun ("two doggie") (E)	

2½ - 3 Years			
Hearing	**Speech**	**Language**	**Cognition**
• Begins making cognitive judgements about what was heard, e.g. "Tell me about your trip to Disney World." (auditory processing) • Answers questions about an undisclosed but familiar topic	• Continues use of echolalia when difficulties in speech are encountered • Exhibits repetitions, especially starters ("I" and first syllables) • Speaks with a loud voice • Increases range of pitch • Consistently uses initial consonants (some are misarticulated); frequently omits or substitutes final consonants • By age 3, 90% of children produce the following consonants in conversation: /p/, /m/, /n/, /h/, /w/ • Accurately pronounces all vowels and diphthongs (except those with an r, such as in the word "bird") • Uses approximately 27 phonemes • Three years: 75-80% intelligibility • Masters ⅔ of the adult speech sounds	• Answers questions with "yes" or "no" (E) • Understands the concepts of "one" and "all" (R) • Uses subject pronoun: he (E) • Asks "What happened?" (E) • Uses "gonna" and "wanna" (E) • Uses 3-4 word sentences; converses with self; MLU 2.5-3.0 (E) • Shows interest in "why" and "how" explanations (R) • Expands use of verb endings (-ing), plurals/possessives ("eat cookies"), contractions (E) • Begins the "why" question stage; asks "wh"-questions ("What's that?" and "Where ball?") (E) • Uses 2-/3-word negative phrases ("no want that") (E) • Asks for "another" (E) • Understands "now," "soon" and "later" (R) • Begins using singular/plural noun-verb agreement (E) • "Converses," relates simple imaginative tales; describes actions in book (E) • Vocabulary: 900+ words	• Matches an object in hand or in the room to a picture ia book • Completes 5+ piece puzzle • Counts 2-3 objects; knows more numbers (but not always in the right order) • Remembers what happened yesterday • Knows where things usually belong **Development Milestones:** Birth to 8 Years • Substitutes one object for another in pretend play (as in pretending a block is a car) • Laughs at silly ideas (like milking a dog) • Avoids some dangers, e.g. a hot stove or moving car • Selects objects not the same or "Which doesn't belong?" from set of objects • Names own drawings • Pretends to be caregiver • Holds up fingers to tell age • States first and last name

3 - 4 Years			
Hearing	**Speech**	**Language**	**Cognition**
• Improves listening skills; comprehends auditory information in a variety of settings (auditory understanding) • Listens attentively and retells stories • Accurately repeats sentences with high predictability • Identifies objects based on description (open set)	• Substitutes some stops for fricatives (i.e. "tat" for "sat") • Increases speech rate • May delete a syllable in multisyllabic words • Simplifies words with blends (i.e. "blue" might be pronounced "bue") • 4 Years: 80-90% intelligibility • The following consonants emerge: /r/, /l/, /s/, /tʃ/, /(ch)/, /ʃ/ /sh,/ /z/ • By 4, 90% of children have mastered the following	• Uses possessives (E) • Uses "we," "she," and "they" (E) • Uses "some," "many," and "all" • Uses present progressive: is/are/ am + verb ing (E) • Uses some irregular verbs (E) • Uses "can't," "not," and "didn't" (E) • Uses "hafta," "have to" and "want to" (E) • Uses 3rd person singular -s (E)	• Identifies and names primary colors • Counts to 10 • Approaches problems from a single point of view • Begins to have a clearer sense of time; wants to know what will happen next • Engages in fantasy play; distinguishes between real and pretend words • Takes turns and can do so without always being reminded • Identifies situations that would lead to happiness, sadness or anger

	sounds in conversation: /b/, /k/, /d/, /j/y, (as in "you"), /f/, /g/	• Expresses ideas and feelings rather than just talking about the world around him/her (E) • Begins using analogies, comparisons; can complete opposite analogies ("sister is a girl; brother is a ___.") (E) • Describes the use of objects such as "fork" or "car" (E) • Enjoys poems and recognizes language absurdities such as, "Is that an elephant on your head?" (R) • Uses "do" to ask yes/no questions (E) • Vocabulary: 1500+ words (E)	• Draws somewhat recognizable picture that is meaningful to child if not to adult; names and briefly explains picture • Distinguishes day activity (playing) from night activity (sleeping) • Sequences familiar routines, simple finger plays, patterns of blocks • Traces/copies figures (squares), drawn objects • Knows division of day - morning, afternoon, night • Matches object to occupation - fishing rod to fisherman

4 - 5 Years			
Hearing	**Speech**	**Language**	**Cognition**
• Recalls 5+ facts from a familiar story • Identifies word that rhymes or doesn't rhyme in set of 3-4	• Five years: 98-100% intelligibility • By age 5, the phonological processes of syllable deletion and fronting are suppressed • The following consonants emerge: (/d3/)-"j" as in jump, /v/, voiced(/∂/) and voiceless(/0/) "th"	• Asks what/who/where or why do questions (E) • Asks whose (E) • Uses does to ask yes/no questions (E) • Converses with longer, more complex sentences, but still makes grammatical errors; MLU 4.5+ (E) • Uses has, does, had (E) • Uses because, when, if and so in clauses (E) • Uses these and those (E) • Uses before and after (E) • Uses comparative adjectives ("small-smaller") (E) • Answers "why" and "how" questions; replies to questions like "What is a house made of?" (E) • By age 5, uses 2500 words (E) • Ends conversations appropriately	• Draws recognizable pictures; copies more complex figures (triangle) • Likes cutting/pasting • Knows own street and town • Begins to relate clock time to daily schedule • Identifies a problem, lists possible solutions verbally and chooses which one(s) are most appropriate • Tells color of unseen object ("What color is an apple?") • Categorizes, naming items without visual clues, e.g. animals, food, toys; decides own criteria for categories • Predicts story from book cover • Names penny, nickel and dime • Knows days of the week

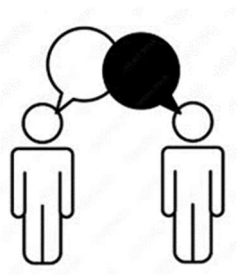
5 - 6 Years			
Hearing	**Speech**	**Language**	**Cognition**
• Expansion of auditory understanding • Can provide a word that rhymes with a given word • Learns letter-soundassociations	• By 6, 90% of children have mastered the following sounds in conversation: /t/, /r/, /ŋ/(ng), /l/ • Uses a variety of blends • Self-monitors speech	• Stabilizes correct usage of irregular plurals and past tense/ irregular verbs (E) • Uses pronouns, propositions and articles correctly, consistently (E) • Uses superlative -est (E) • Uses -er to form nouns (teach/ teacher) (E) • Uses future progressive: will be + verb + ing (E)	• Says letters of alphabet • Understands that letters written on a page represent spoken words • Understands number concepts to "10" • Rote counts to 30+ • Recognizes and can reproduce many shapes, letters and numbers • Plays games by the rules

		• Asks wh questions with does (E) • Uses sentences with 8+ words; uses compound and complex sentences (E) • Understands time sequences (what happened first, second, etc.) (R) • Vocabulary: 2800+ words (R); 2500+ (E)	• Understands seasons of the year • Begins to think about their own behavior/actions and to see consequences/explain situations • Begins to read and write, distinguishing capitals and lowercase • Uses invented spelling (e.g. color could be spelled "kulr") (E) • Arranges objects in order, according to size • Completes simple maze • Adds, subtracts • Comprehends directional commands - left/right

6 - 8 Years			
Hearing	**Speech**	**Language**	**Cognition**
• Provides a synopsis/summary after listening to information one time	• Most children have typical articulation by age 7 • By 7, 90% of children have mastered the following sounds in conversation: /ʃ/(sh), /t ʃ/(ch), /ʃ/(sh), /t ʃ/(ch), (/d3/), /j/ (/0/) "th" • By 8, 90% of children have mastered the following sounds in conversation: /s/, /v/, /z/	• Uses irregular comparative/ superlative: better, best, worse, worst (E) • Uses past perfect tense ("She had read the book.") • Uses past perfect progressive ("had been camping") (E) • Asks "has" questions with present perfect ("Have you been there before?") (E) • Passive voice developed by most children (E) • Uses well formed narratives (E)	• Can develop a plan to meet a goal • Rote counts to 100+ • Understands and uses riddles and idioms ("Hold your horses") • Tells jokes • Tells own address, phone number • Names months of the year • Names month for a given holiday • Can tell time

Communication Options

What is Language?



All children need language and communication skills to make sense of the world around them. They use language to build relationships with other people. It is how they communicate and are understood by others. Language and communication skills are receptive. This means they understand others. Language and communication skills are also expressive. This means others understand them. Language is a way to share information. It uses words, phrases, and grammar.

For children to develop a language, they need to be surrounded by users of that language. During their first year, babies will have receptive language. They will understand a lot of what is said to them but will be able to say very little. Later they will develop expressive language.

What is Communication?

Communication is how we share information, ideas, and feelings with other people. It is a two-way process. It is not only what we say or sign. But it also uses eye contact, gestures, tone of voice, facial expressions, and body language. Communication begins from birth. It starts with cries. Moves to coos and smiles and then first words.

Communication with a deaf or hard-of-hearing child requires support, commitment, and encouragement from families and professionals. With this support, deaf and hard-of-hearing children can communicate as well as typically hearing children. What is most important is deciding which communication opportunities best suit your child and your family. By starting this early, your child can express their feelings and emotions. They can build connections with family, friends, and community. Next you will see descriptions of communication opportunities:

Listening and Spoken Language (LSL)

The Listening and Spoken Language (LSL) approach focuses on listening to spoken language. Children must have the best possible access to sound. This focuses on hearing technology such as hearing aids, bone conduction devices, or cochlear implants. The focus of this option is to use auditory information only. It assumes that most children with hearing differences can be taught to listen and speak. It requires early intervention and consistent training to achieve the best hearing potential. Natural gestures, body language, and speech reading are accepted. Lip or speech reading can be used. This is involves carefully watching the lip patterns, movement of the tongue, and face of the person speaking. We know that only 30% to 40% of speech sounds can be lip-read, but this can provide extra information to assist in understanding spoken language.

American Sign Language (ASL) as Primary Language

Sign languages are visual languages with vocabulary, construction, and grammar. They use hand shapes and movements, facial expressions, and body language. ASL is its own language with its own grammar, rules,, word formation, jargon/slang and word order. ASL is a rich and complex language that has the same linguistic properties as spoken language.

ASL is an integral part of Deaf culture. You may notice that sometimes the word Deaf is capitalized. This indicates that the person the word is referring to associates with Deaf culture and likely uses ASL as their primary mode of communication. Individuals who use ASL as their primary language and who identify as Deaf have many of the same opportunities as individuals who use LSL (listening and spoken language). They live rich, full lives and most have a strong sense of pride and identity around their Deafness. Today, the opportunities for Deaf children are endless and they have the ability to accomplish incredible things.

Children most often learn language from their parents. If you are a hearing parent who is not fluent in ASL and would like ASL to be your child's primary mode of communication, you will need to become proficient in ASL as soon as possible. This will not only allow you to model ASL to your child but also allow you to communicate effectively with them. Learning ASL is difficult and takes time and effort. To become proficient in ASL, you will need to enroll in ASL courses, and we strongly recommend interacting with Deaf community members. If you would like a list of local ASL courses, please let your audiologist or Early Start representative know and they would be happy to provide them to you.

Deaf individuals will often attend a School for the Deaf and it is important to investigate local resources/educational opportunities in your area if ASL is your child's primary communication modality.

American Sign Language (ASL) as a Supplementary Language

Families decide to learn ASL for many reasons. Some families choose to learn ASL because they provide their children as many communication opportunities as possible. For example, a family of a child with a cochlear implant might learn ASL. They want their child to choose whether they want to use spoken language or ASL in the future. Some families learn ASL so they can continue to communicate with their deaf or hard-of-hearing child when they are not wearing their hearing devices. An example of this would be during water activities. Learning ASL can also provide your child with a connection to their identity as someone with a hearing difference.

Some families who don't have a deaf or hard-of-hearing child might decide to learn ASL. They do this to support language development while the child is young. Hand-eye coordination develops earlier than speech skills. Babies exposed to full ASL often use their first sign around 10 months. Babies who don't use ASL will have their first spoken word at 12-13 months.

Once identified as deaf or hard of hearing, many children are fit with hearing technology. This gives them the opportunity to be exposed to spoken language. ASL can still be a good choice as it can assist in understanding spoken language. Deaf children might choose to stop signing as their spoken language develops. But ASL might be their preferred language or will play an important role in communication. Learning ASL allows deaf children to communicate with other children who sign. This can enrich their experience and understanding of Deaf culture.

Some people worry that using ASL will prevent or delay their child learning to speak. In fact, learning ASL can help you to communicate with your child. No evidence exists that shows that the use of ASL will delay or stop children from developing speech as long as they are also exposed to spoken language.

Total Communication (TC)

You might hear about total communication (TC). This is a combination of many approaches listed above. Total Communication can use a variety of methods. It can include sign, speech and hearing, fingerspelling, gesture, facial expression and lipreading. It uses whatever combination works best for the deaf child. It is based on the principle that deaf children can learn to communicate effectively by using all methods of communication at the same time. Sometimes, this ends on focusing on one thing much more than another. This does not provide the CONSISTENT access to language that is necessary for language development.

Bilingual-Bimodal (BiBi) or Bilingual-Bimodal-Bicultural (BiBiBi)

The Bilingual-Bimodal (BiBi) or Bilingual-Bimodal-Bicultural (BiBiBi) supports being able to use two different languages successfully. In this case, at least one language would be (ASL). Children also learn written and spoken English plus any additional languages spoken at home. Parents will need to develop a good level of ASL to help create a good bilingual environment at home. The Bilingual-Bimodal approach is a philosophy that sees Deafness as a positive identity and culture.

Cued Speech

Another opportunity is cued speech. This is a system that provides visual access to a spoken language. It uses eight hand shapes with six different positions/movements. These are designed to accompany natural mouth movement/speech. It also uses natural facial expression and body language to make the different sounds of speech 'visible'. Cued Speech is not a language by itself. It is used to visually represent a language and has been adapted to support over 60 spoken languages. Cued speech was developed in 1966 to improve access to English in native signers. Cued speech can be used as a tool for any child using ASL as a first language, BiBi(Bi), and possibly with LSL.

Exploring your Opportunities

It can feel like a big task to explore communication opportunities for your child. Remember, the choices you make now don't have to be permanent. As your baby grows and reaches their first milestones, we can help you to monitor their progress. You can always decide to try a different opportunity or use different tools.

The way you choose to communicate with your child should be guided by what your child needs. Sometimes availability of support for your chosen communication approach might not exist in your area. We will help you if your preferred communication opportunity is not routinely supported in your area. We can provide information about where you might get the support you need.

You can get information from your local services about your communication choice. There are also academic institutions, charities, and private businesses that can direct you to research that may help to make your choice. These organizations might promote only one specific communication approach. These groups might have evidence to show that their approach is successful. There isn't enough evidence to show that ANY one method of communication is better than another. Every deaf child is different. What works for one family might not be the best option for another.

Be aware of the potential biases of those informing you about the different opportunities and make sure you explore a variety of perspectives. A few things to consider are:

- Although some opportunities may work with some children, they may not work with others.
- Your choice shouldn't be guided by your child's level of deafness alone.
- All communication opportunities can be successful for children with a variety of levels of deafness but access to sound is critical to the development of spoken language.

Changing your Approach

Your child will develop. You will learn more about their natural strengths and style of learning. Because of this, you might want to try different communication opportunities. That doesn't mean your first choice was wrong. After all, you made your decision based on what seemed right at the time. You might find that even though your child is coping socially and educationally, they are not thriving. This might mean you need to consider whether your first choice is still the best one. Monitor your child's development against typical expectations. Also look at how their communication allows them to enjoy friendships and social experiences.

We are prepared to discuss your child's progress and development with you. We can support you as you consider other opportunities. We want to support your child to make the best progress. Please reach out to us if you are worried about any aspect of your child's development. We can work with you as you re-evaluate your choice of approach. Here are some questions to considers:

- Will it involve changing nursery or school?
- Will it involve different ways of supporting your child's social needs?
- Might you need to learn new approaches as a family?
- What impact might change have on your child?
- Is your child old enough to express a view themselves?

Your child's or your family's view is different from yours. It is then important for you all to talk through the possibilities with the professionals who know you. As your child gets older, they will develop their own communication preferences. All children are different, and their needs and preferences can change over time. Make sure to give any communication opportunity a chance to succeed before deciding any change may be needed.

How can I start communicating with my baby right now?

Parents of young babies are experts at communicating with their babies. This happens long before babies learn to talk or understand language around them. All of us have seen parents making funny

faces for their babies. When an adult makes a silly face for their baby, at first the baby might look surprised. Then the baby might break into a wide smile, or giggle. They might wiggle their arms or legs. Communication also happens when a baby is being rocked or fed.

Communication can include touch, facial expressions, eye contact), gestures, and sound. Extending your arms to your infant shows that you are about to pick them up. Other ways of communicating include smiling, laughing, hugging, kissing, and letting your baby keep you in sight. Your physical and visual contact with your baby tells them that you are there. It tells them that they are safe.

Many babies with atypical hearing thresholds have some hearing. We call this residual hearing. This means that they can partially hear voices, especially if the person talking is very close. Try speaking to your baby while holding them. Be sure to NOT shout. Talk the same way you would talk to other babies. Your baby might be very interested in looking at faces. They will begin to understand that your face and mouth are sending important messages. Some things to remember when communicating with your baby:

- Hold your baby close so that they can focus on your face.
- Position your baby so that you are often within sight.
- Try to minimize background noises. This lets your child use the hearing they have to hear speech.
- Use good lighting. Be sure that the room is not too dark. Also, don't have the lights too bright so that they have to squint into the light.
- Make eye contact often.
- Imitate the movements and sounds your baby makes. Wait for them to repeat the sounds.
- Communicate with your child during activities that you both enjoy.
- Communicate with your child many times throughout the day.
- Give you and your child some quiet time. If your child becomes overwhelmed, they might become fussy.
- ENJOY the time you and your child spend together.

Intervention/Amplification Options

Good intervention plans will include close monitoring of your child and your family's needs. We will want to have follow-up appointments to check progress. There are many different options for children with hearing differences and their families. We have discussed communication options already. We will, in this section look at amplification options. You might also consider joining a support group. We have several options of support groups included in the resource section.

For children aged 0-3 years we know that atypical hearing can affect a child's ability to develop speech, language, and social skills. The earlier a child who is deaf or hard-of-hearing starts getting services, the more likely the child's speech, language, and social skills will reach their full potential. One important member of the intervention team is a speech-language pathologist. They teach communication strategies to you and your child. They can provide information on in-home activities. Ideally, these support services would start before your child is 6 months of age. There are many services available through the Individuals with Disabilities Education Improvement Act (IDEA) 2004. Services for children from birth through 36 months of age are called Early Intervention or Part C services. The IDEA 2004 says that children under the age of 3 years (36 months) who are at risk of having developmental delays may be eligible for services. For more information, please see the next section on Laws Protecting the Deaf and Hard of Hearing.

If your child is diagnosed with a permanent hearing difference, our team will provide you with amplification/intervention options. We know that atypical hearing thresholds can disrupt listening and spoken language development. If your goal is to have your child develop spoken language, hearing aids or cochlear implants are often recommended. We will work with you to help you select what would be most appropriate. Several of the variables we consider are:

- Your child's age and needs
- The degree and type of the child's hearing thresholds
- The durability of the device
- The service from the manufacturer
- The hearing aid's ability to connect to other devices that are used in school.

The primary goal of hearing instruments is to ensure spoken speech is audible to the child. During the hearing device evaluation (known as a Hearing Aid Consult), we discuss the amplification options available for your child. During the fitting of the hearing device(s) we will program the hearing device(s) according to your child's needs and hearing levels. We will teach you (and your child) how to use and care for the hearing device(s). At the follow up appointment, we will test your child's hearing with their hearing devices on (if appropriate). Prior to obtaining a hearing aid, two things are required:

- A medical clearance from an ear, nose, and throat (ENT) physician obtained within the last six months of the fitting of the hearing device(s);
- A hearing test performed within the last six months of the fitting of the hearing device(s).

Air Conduction Hearing Aids

The audiologist will recommend which type of hearing device is best for your child's type of hearing thresholds. They will then work with your family to make sure that your child is getting the most out of their hearing device. Most often, children are fit with hearing aids called Behind-the-Ear (BTE) hearing aids. These styles of instruments are particularly suitable for children. They can often allow for connection to other devices in the classroom. This style of hearing aid fits behind the ear and is anchored in the ear canal with an earpiece. Most of these devices use an earmold which is a fitted for the child's ear and attaches to the hearing aid. It directs sound from the hearing aid into the ear canal. Each person's ear is shaped differently, and a child's ear will change as they grow. Earmolds are individually made for each child to make sure they fit comfortably. We use a soft material to make a copy of the child's outer ear canal. This is used to make an earmold that will fit the child exactly. As the child grows, new earmolds can be made and attached to the same hearing aid.

Sometimes older children are fit with smaller hearing aids or hearing aids that fit completely in the ear canal. Receiver in the Canal (RIC) hearing aids are similar to BTE hearing aids but use a wire to attach to the earpiece rather than a rubber tube and tend to be less durable. In the er hearing aids, depending on the size of the hearing aid, are named In-the-Ear (ITE)/In-the-Canal (ITC)/Completely-in-the-Canal (CIC). These styles are not recommended for young children due to growth of the ear canal in young children. As the ear canal grows, these would become loose in the ear and need to be replaced. Also, the small size of the aid is often considered choking hazard.

Bone Conduction Hearing Aids

Another type of hearing aid is called a Bone Conduction Hearing Aid or Bone Anchored Hearing Aids (BAHA) device. These styles of hearing devices are used for children that have a hearing difference in the outer or middle ear that cannot be medically treated. These can also be used with children who have limited usable hearing unilaterally (LUHU)/single-sided deafness (SSD). Bone conduction devices provide sound through a small vibrator that is attached to the head via a wearable headband or surgically implanted attachment.

Cochlear Implants

A cochlear implant can help a person with severe to profound hearing difference. It gives that person a way to hear when a hearing aid is not enough. Unlike a hearing aid, cochlear implants do not make sounds louder. A cochlear implant sends sound signals directly to the hearing nerve. These signals bypass the inner ear hair cells that are damaged. A cochlear implant has two main sections. The first section is placed inside the head during surgery. The surgery takes a few hours and general anesthesia is needed. Children and adults getting a cochlear implant might stay one night after the surgery. Children will then receive the second part of the implant-the processor that is worn outside of the ear a few days after surgery. The parts outside the ear send sounds to the parts inside the ear.

If you think you want your child to have a cochlear implant, your child will need to be evaluated to see if they are a candidate. This is a multi-step process, and our team will work with you to get you scheduled for these necessary appointments.

Retention Solutions

For children who wear hearing devices, keeping them on the head can be a struggle. While there are many, many options, some of the most common include:

- Retention cord(s): A retention cord is usually one or two cords. On one end of the cord is a loop or ring you can place around the hearing aid. On the other end of the cord is a clip which attaches to the child's clothing. If the device falls of the head or ear, it will dangle by the cord by the clip on the clothing.
- Toupee tape: This is a double-sided tape that will allow you to "tape" your child's hearing aid to their head's skin, making it harder for it to fall off.
- Elastic headband: There are headbands you can place around the head and ears that could prevent the hearing aids or cochlear implant from coming off your child's ears. It is important that the headband is made of a material through which sound can travel without being damped.
- Bonnet or Pilot Cap: You can use a bonnet over the head and ears to make it harder for your child to take off the hearing devices. Just as with the headband, make sure the bonnet is made out of a material that allows the sound to go through it without it being damped.

Laws Protecting the Deaf and Hard of Hearing

There are three very important federal laws you should know about that protect your child's equal access to education.

Americans with Disabilities Act (ADA)

The ADA requires any public entity to "take appropriate steps to ensure that communications with individuals with disabilities are as effective as communications with others," and that the child has "an equal opportunity to participate in, and enjoy the benefits of, a service, program, or activity conducted by a public entity." This law allows a parent to request educational services that will allow the child with atypical hearing the opportunity to achieve as well in school as their typically hearing peers. It is then the school's responsibility to provide the requested services. This also protects the child's right to interpreters, FM systems, and captioning as needed.

Individuals with Disabilities Education Act (IDEA)

According to IDEA, instruction must be adapted "to (1) address the unique needs of an eligible child. that result from the child's disability, and (2) "ensure access of the child in the general curriculum so that they can meet the educational standards within the jurisdiction of the public agency that apply to all children." For children older than three years of age, an Individualized Education Plan (IEP), can be created that considers the needs of the child. In the case of a deaf and hard-of-hearing child, this means considering the child's language and communication needs. It means ensuring opportunities for direct communications with peers and professional personnel in the child's language and communication mode.

Section 504 of the Federal Rehabilitation Act of 1973

More specific than the ADA, Section 504 also mandates the right of a child who is deaf or hard of hearing to speech therapy, interpreters, FM Systems, etc. Section 504 also mandates every state to have a Protection and Advocacy (P&A) agency. This agency provides information and advocacy services to persons with disabilities. The California P&A can be reached at 916) 322-3360; Toll free number: (800) 952-5225; Line for the hearing impaired: (916) 324-5564; Toll free number: (800) 952-5548.

Resources for school-aged children who are Deaf and Hard of Hearing

Most of the information provided in previous pages can be helpful for children of all ages. There are a few things that might be more helpful for an older child:

Special Education

Not all children with atypical hearing will be in a special education setting. Many children with atypical hearing levels do very well in school, especially if they have access to early intervention. However, atypical hearing is considered a disability. Children with atypical hearing are at high risk for speech and/or language delays. They can have educational and learning problems. They might have behavior issues and attention deficits. Children may benefit from being placed on an IEP (Individualized Education Plan) or a 504 Plan. An IEP is a document that identifies what special education services a child must receive. A 504 Plan is for any child with a disability that does not need special education services. Both allow the school and parents to work together. They discuss and monitor classroom performance. They prepare an appropriate school environment. These services are available through the Individuals with Disabilities Education Improvement Act 2004, Part B. Services are provided through the public school system.

Schools for the Deaf

If your child's primary mode of communication is ASL, it is likely that the most appropriate learning environment may be a school for the Deaf. They can ensure access to all instruction and educational content for Deaf in their preferred language. Schools for the Deaf can provide excellent educational opportunities for students and allow the Deaf child to be surrounded by peers and staff who they can identify with. There are many schools for the Deaf in California. There are also multiple Deaf Universities in the United States for college-aged Deaf individuals.

Social/Emotional Impacts of Atypical Hearing

Children who are deaf or hard of hearing are more likely to face auditory and language challenges. They might become easily tired-called listening fatigue. They might experience auditory misperceptions which is misunderstanding sounds. They can have trouble keeping up with conversations. They might not understand subtle language cues. It is important that they learn how to identify if they have missed something. They need to know how to repair a conversation to improve overall communication. There are several ways that children can be taught to improve their Social/Emotional Language (SEL) skills.

- Optimizing Auditory Access

  For children who use listening and spoken language to communicate, it is important they have the best auditory access possible. This means regular visits with the Audiologist. It means that either the parent (when kids are young) or the child needs to check the equipment/device every morning.
- Developing Emotional Self-Awareness

Children can learn to label their emotions beyond just happy and sad. They can explain if they are excited or nervous. They can practice ways of managing feelings. Ideas might include bouncing on a Cushion or taking deep breaths while counting. This can help manage actions that might be considered problematic in a school setting.

- Building Self-Advocacy Skills

Children must develop strong, age-appropriate self-advocacy skills. They need to report if the remote hearing aid or cochlear implant is not working. Most social situations come with a lot of noise. Places like a sports field or cafeteria might be noisy. Children need to be able to explain when they are having trouble hearing.

- Supporting Pragmatic Language Skills

Deaf and hard of hearing children often struggle to develop pragmatic skills. These can also be called social communication skills. Language and behavior changes with the audience. We don't talk the same way to our friends as we would a teacher or store clerk. Families can discuss the ways we communicate in different situations.

Hearing Assistive Technology

Hearing assistive technology might be used with even very young children, but it is often employed as a child becomes older. Being able to understand in the classroom is a critical component for learning. In a typical spoken language-based classroom, there is often background noise. This can be loud enough to affect speech understanding, attention, and academic achievement. In addition, most teachers will turn to the board or move around a classroom, causing the loudness of their voice to vary.

For children with typical hearing, these everyday classroom noises and events do not create a large problem. For hard of hearing children, the speech signal is not loud enough or clear enough to allow for maximum understanding. Even children with minimal hearing levels, fluctuating hearing, or unilateral hearing differences struggle with background noise interference and variations in the loudness of the teacher's voice. To increase a child's access to sound. Hearing assistive technology can be used. This is often helpful in noisy settings like a classroom environment or a restaurant. There are several types of hearing assistive devices. The two most commonly used are the personal and classroom Remote Microphone Systems (RMS) which are described below:

- **Personal Remote Microphone System (RMS): when** using a personal RMS, the person speaking wears/holds a transmitter microphone. This could also be placed in the middle of a group if more than one person is speaking. The listener wears a receiver that connects to their hearing aid or cochlear implant. Using harmless radio waves, the RMS sends the speech signal to the listener.
- **Classroom Remote Microphone System (RMS): another** RMS option is a classroom sound field system. With this system, the speaker still wears/holds a transmitter microphone. This can still be placed in the middle of a group if more than one person is speaking. Speakers in the classroom amplify the speech to a level louder than the background noise. All children in the room enjoy the benefit.

Studies have shown that RMS have the best results when children use them as soon as possible after being fit with hearing aids or a cochlear implant. These devices can help facilitate improved spoken language development. This is one of the things we will consider when picking a hearing aid or cochlear implant.

Other Assistive Technology

There are other devices that you might hear. We are happy to talk to you about these as they make sense for your child. These include:

Noise Protection/Musician's Molds

Studies have shown that many children have worsening hearing thresholds due to noise. We know that for children 6-19 years of age, up to 16% have some degree of noise induced hearing differences. We often overlook the dangers of noise and music in school-aged children and teenagers. Noise protection and musician's earplugs are created using a custom impression of the ear. The molds are then fit to the child/teenager's ear a few weeks later. These types of molds allow the child to enjoy noisy activities (concerts, sports events, etc.) without permanently impacting their hearing.

Swim Molds

When children are instructed by their physician to not allow water to get into the ear, we can obtain swim molds. A custom swim mold requires an impression to be taken of the ear, mailed to a manufacturer of swim molds, and then fit to the child's ear approximately a few weeks later.

Telephone Solutions

Most hearing devices now have telephone solutions to allow for better connection to the phone. Many options exist for louder ring tones or volume controls.

Television Solutions:

Television solutions to be used both with and without hearing devices. They can use infrared, Bluetooth, and FM technology. These devices direct sound right to the ear. This allows for the elimination of bothersome background noise. These systems allow a child to listen to the TV at a comfortable listening level without disturbing others in the room.

Alerting Devices

Depending on the severity of the hearing levels, some children may not be able to hear important warning signals. Alerting systems help a hard-of-hearing child be aware of important events such as doorbells ringing, knocks at the door, telephone ringing, smoke/fire alarms, and alarm clocks. Alerting devices can supplement the use of hearing devices by providing visual/vibrotactile stimulation to sound.

Induction Loop System

An audio frequency induction loop is a wire that circles a room and is connected to a sound system that transmits the audio signal to hearing devices. It can be found in many public buildings including banks, post offices, churches, and theaters.

Captioning

Many television programs, videos, and DVDs are captioned. Television sets made after 1993 are made to show the captioning. Captions show the soundtrack of a program on the bottom of your television screen. If you have your child watch children's programs, you may want to turn on the captioning.

Resources/Referral Sources

The Audiology Team at Rady Children's Hospital is available to offer support and answer any questions you may have about your child's new diagnosis. We have provided a variety of information on our website which you can access at www.rchsd.org/programs-services/audiology-hearing. We have also listed important resources below.

Hearing screening

- American Speech-Language-Hearing Association - http://www.asha.org/public/hearing/Hearing-Testing Provides information on newborn hearing screening.

- Centers for Disease Control and Prevention (CDC); NCBDDD; Early Hearing Detection and Intervention Program (EHDI) - https://www.cdc.gov/ncbddd/hearingloss/index.html Provides information about children with atypical hearing. Answers some commonly asked questions. Information about state EHDI programs is also available.

- Maternal and Child Health Bureau, Health Resources and Services Administration - https://mchb.hrsa.gov/early-hearing-detection-intervention-ehdi Provides information about Early Hearing Detection and Intervention Programs.

- National Center for Hearing Assessment & Management - www.infanthearing.org/screening/index.html Provides information on newborn hearing screening programs, legislation, equipment, and other related issues.

Atypical Hearing

- Better Hearing Institute - www.betterhearing.org/ Provides information on atypical hearing, tinnitus, and hearing aids.

- CDC – Parent's Guide to Hearing Loss - https://www.cdc.gov/hearing-loss-children-guide/parents-guide/index.html Guide which provides information topics of interest families with a child with atypical hearing.

- Central Institute for the Deaf - http://www.cid.edu/ Network of resources on the treatment of adult and childhood deafness.

- Hereditary Hearing Loss Homepage - http://hereditaryhearingloss.org Provides current information on the genetic causes of atypical hearing.

- Laurent Clerc National Deaf Education Center - www.clerccenter.gallaudet.edu/ndec/ Provides information for families regarding atypical hearing and multicultural issues.

- My Baby's Hearing - www.babyhearing.org This site was developed by Boys Town National Research Hospital. It provides information about infant hearing, how the ear works, family issues, and some available intervention options.

- Healthy Hearing – https://www.healthyhearing.com/help/hearing-loss/children Has articles designed to provide information about atypical hearing in children.

Family support

- Exceptional Family Resource Center - *www.efrconline.org* Organization designed to empower families of children with special needs in San Diego and Imperial Counties.

- Department of Developmental Services: Early Start Program - https://www.dds.ca.gov/services/early-start/what-is-early-start California' program to provide intervention services for infants and toddlers with disabilities.

- National Association of the Deaf - *www.nad.org* Civil rights organization to support deaf and hard of hearing individuals.

- Deaf Community Services of San Diego – *www.deafcommunityservices.org* This organization provides a variety of services to include community advocates, interpreting services and youth and family services.

- Alexander Graham Bell Association for the Deaf & Hard of Hearing - www.agbell.org International nonprofit membership organization, support network, and resource center on pediatric atypical hearing and spoken language approaches and related issues.

- American Society for Deaf Children - www.deafchildren.org A national organization of families and professionals creates opportunities for children who are deaf and hard of hearing to gain full communication access through the use of ASL.

- Beginnings For Parents of Children Who Are Deaf or Hard of Hearing, Inc. - http://www.ncbegin.org Provides emotional support and access to information as a central resource for families with children who are deaf or hard of hearing, age birth through 21 years of age.

- Family Voices - www.familyvoices.org A national, grassroots organization that is a clearinghouse for information and education concerning the health care of children with special health needs.

- Hands & Voices - www.handsandvoices.org Nonprofit, parent driven organization that provides support to families with children who are deaf or hard of hearing.

- John Tracy Clinic - www.johntracyclinic.org Nonprofit organization that provides parent-centered services to young children with a atypical hearing.

- ZERO TO THREE: National Center for Infants, Toddlers and Families - www.zerotothree.org
  A national non-profit organization that promotes the healthy development of infants and toddlers by supporting and strengthening families, communities, and those who work on their behalf.

Cochlear implants

Please refer to the following links to obtain information about each of the three cochlear implant companies offering services in the US.

- Cochlear Corporation – *www.cochlear.com*
- Advanced Bionics – *www.advancedbionics.com*
- MED-El -- *www.medel.com/us/*

Communication options

- Auditory Learning Center - http://auditorylearningcentre.com The Center's objective is to promote listening and speaking as a way of life for children who are deaf or hard of hearing.

- National Cued Speech Association - www.cuedspeech.org Nonprofit membership organization that provides information about Cued Speech and its applications and educational services.

- Alexander Graham Bell Association for the Deaf & Hard of Hearing - www.agbell.org
  International nonprofit membership organization and resource center on atypical hearing, spoken language approaches and related issues.

- The S.E.E. (Signing Exact English) Center for the Advancement of Deaf Children - http://seecenter.org Nonprofit organization to work with parents and educators of children who are deaf and hard of hearing.

- American Association of the Deaf-Blind - www.aadb.org National consumer organization of, by, and for deaf-blind Americans. "Deaf-blind" is a broad term that describes people who have varying degrees and types of both vision and hearing.

- Helen Keller National Center for Deaf-Blind Youths & Adults - https://www.helenkeller.org
  Deaf-blind school that offers intensive and comprehensive rehabilitation training to youth and adults who are deaf-blind. Also provides field services and general information.

- Dawnsign Press - www.dawnsign.com American Sign Language and Deaf Culture Materials (books, videos, workbooks, etc.).

- National Association of the Deaf - www.nad.org Provides information on programs and activities including grassroots advocacy and empowerment, public awareness, deafness-related information, legal assistance, and policy development.

- Sign Media, Inc - www.signmedia.com/info/smi.htm Provides Videotapes and print materials on ASL and American Deaf Culture.

Educational Resources

- Council on Education of the Deaf - www.deafed.net This site facilitates informational sharing and collaborative activities within the field of deaf education.

- Gallaudet University - www.gallaudet.edu This site provides information on the only liberal arts university in the United States for undergraduate students who are deaf and hard-of-hearing. Graduate degree programs and continuing education courses are available as well.

- Office of Special Education and Rehabilitation Services (OSERS), U.S. Department of Education - https://www.ed.gov/about/ed-offices/osers OSERS supports programs that help educate children and youth with disabilities, provides for the rehabilitation of youth and adults with disabilities and supports research to improve the lives of individuals with disabilities.

- San Diego Unified School District Deaf and Hard of Hearing Support and Services - https://www.sandiegounified.org/academics/special_education/support_and_services Provides information on support services including general education, special day classes, special school and non-public school placement.

- Hope Infant Family Support Program - https://www.sdcoe.net/schools/hope Provides information about support for children birth to 3 years of age.

Professional organizations

- American Academy of Audiology - www.audiology.org Dedicated to providing quality hearing care to the public and provides consumer and professional resources related to hearing care.

- American Academy of Family Physicians - www.aafp.org A national medical organization of family physicians, family practice residents, and medical students.

- American Academy of Otolaryngology—Head and Neck Surgery - www.entnet.org Organization of physicians dedicated to the care of ear, nose, and throat disorders. This site provides health tips and information related to hearing disorders.

- American Academy of Pediatrics - https://www.aap.org Provides information, alerts, and resources related to the physical, mental, and social health of infants, children, adolescents, and young adults.

Hearing Dogs for the Deaf

- Canine Companions for Independence - www.caninecompanions.org National organization that enhances the lives of people with disability by providing trained services dogs to the recipient.

- Paws with a Cause – www.pawswithacause.org National organization that provides custom-trained assistance dogs to people with disabilities.

Hearing Aids in Pop Culture and Media

In movies, TV shows and literature, atypical hearing has often been used as a dramatic plot device. Often these have included stereotypes or misrepresentations. A few exceptions include:

- "Switched at Birth" - An American TV show that follows two teenagers who were switched at birth. One of the characters lost her hearing due to bacterial meningitis. Daphne learns to navigate challenges. She uses technology and sign language to communicate efficiently. She becomes an advocate for herself and others. She helps raise awareness about deaf challenges.
- "The Golden Bachelor" - This show features Gerry Turner, a 72-year-old bachelor who wears hearing aids. The show is notable for how Gerry and other cast members embraced their hearing aids, normalizing the use of hearing devices in a mainstream TV setting.
- "Mr. Holland's Opus"- This film portrays the life of a music teacher who struggles to accept his deaf son. The film spans three decades and shows how he ultimately finds ways for deaf children to understand music.
- "Sound and Fury"- A documentary about an extended family with deaf members. It explores the dilemma of whether to give their children cochlear implants, considering the impact on their deaf identity and culture.
- "Gaunt's Ghosts" by Dan Abnett - This science fiction series features characters experiencing declining hearing due to noise exposure. The story explores how they adapt to this challenge. It includes the use of sign language for communication.
- "Tintin" by Herge - This classic comic series features Professor Calculus, a deaf and hard-of-hearing character. He faces communication challenges with ideas on how to meet the challenge.

Reading List

Deaf Culture

- *Train Go Sorry: Inside a Deaf World (1995)* by Leah Hager Cohen
  Cohen takes readers on a journey into the world of the deaf, offering an intimate look at the experiences, challenges, and triumphs of the deaf community.

- *Deaf Gain: Raising the Stakes for Human Diversity* (2014) by H-Dirksen L. Bauman & Joseph J. Murray
  This is a groundbreaking book on deaf culture that challenges the traditional deficit-based view of deafness and instead presents a compelling argument for the unique benefits and perspectives that deaf individuals bring to the world.

- *Seeing Voices* (1989) by Oliver Sacks
  Through his in-depth research and personal experiences, Sacks delves into the history, evolution, and significance of sign language, offering a profound insight into the richness and complexity of Deaf culture.

- *The Mask of Benevolence: Disabling the Deaf Community* (1999) by Harlan Lane
  The Mask of Benevolence challenges the prevailing notion of benevolence towards the deaf community. Lane argues that this benevolence can actually be disabling, as it perpetuates the idea that deaf individuals are in need of fixing.

- *For Hearing People Only: Answers to Some of the Most Commonly Asked Questions about the Deaf Community, Its Culture, and the Deaf Reality* (2003) by Matthew S. Moore & Linda Levitan
  This enlightening book provides insights into the deaf culture, its unique language, and the challenges faced by the deaf community.

Education

- *Deaf and Hard of Hearing Learners With Disabilities: Foundations, Strategies, and Resources* (2022) by Caroline Guardino, Joanna E. Cannon & Peter V. Paul
  This book research-based strategies for meeting the needs of deaf and hard of hearing learners with disabilities.

- *Language Learning in Children Who Are Deaf and Hard of Hearing: Multiple Pathways* (2001) by Susan R. Easterbrooks and Sharon K. Baker
  This book looks at the acquisition of language by children with atypical hearing and proposes multiple pathways by which children can acquire a useable system of communication.

- *Special Needs Advocacy Resource Book: What You Can Do Now to Advocate for Your Exceptional Child's Education* by Rich Weinfeld & Michelle Davis
  This handbook teaches parents how to work with schools to achieve optimal learning situations and accommodations for their child's needs.

Children's Books

- *Simone* by Sonya Giridhar [Age range: 2 and up]
  Sometimes when Simone is at school, the teacher's voice doesn't make it all the way to her ears. Anything she says gets mixed up! Despite these challenges, Simone is a "Super Listener" who uses her listening power, her brain power and her FM system to better understand her teacher.

- *Mila Gets Her Super Ears* by Ashley Machovec [Age Range 3-8]
  Come join Mila and her family on their journey as they navigate the world of hearing aids and cochlear implants!

- *Bessie Needs Hearing Aids* by Jenna Harmke [Age range: 4-6]
  Bessie the Bunny is so excited to start her first day of preschool, only to come home disappointed that she can't hear her new classmates. Once she is fitted with her own devices, Bessie can enjoy all the fun of preschool.

- *Oliver Gets Hearing Aids* by Maureen Cassidy Riski & Nikolas Klakow [Age range: 4-8]
  Oliver the Elephant just wants to be able to hear his teachers in class, listen to the TV with his siblings and play with his friends at recess. But when he can't hear them, he's feeling left out and sad. Oliver's parents bring him to see an audiologist to be fitted with hearing aids. Once he receives his hearing aids, Oliver is finally able to participate in his favorite activities.

- *Cosmo Gets an Ear* by Gary Clemente [Age range: 4-8]
  Cosmo Pizzatola's family notices that he's struggling to hear because he turns up the TV really loud. His mother takes Cosmo to get his ears checked right away and the family learns that he needs hearing aids.

- *Gracie's Ears* by Debbie Blackington [Age range: 4-8]
  Gracie has a daily routine just like every other little girl. The only difference with Gracie is that her ears are asleep. Her mother takes her to see several specialists, who fit Gracie with hearing aids.

- *I Deaf-initely Can* by Karlie Waldrip [Age Range 4-8]
  This book follows the story of Rhett, a deaf Australian Cattle Dog. In a shelter he meets Karlie who adopts him and teaches him how to sign.

- *Zola Gets Hearing Aids* by Narita Snead [Ages 5-12]
  Zola does not hear as well as other kids and today is the day she will go to a doctor to have her hearing checked.

- El Deafo by Cece Bell [Age range: 8-11]
  Cece's starting a new school and all she wants to do is make friends. However, she feels different because of her hearing aids and fears the device is scaring off any potential friends.

Locations

SAN DIEGO

Plaza: 3665 Kearny Villa Rd., Suite 400
San Diego, CA 92123
Phone: 858-966-8100
Fax: 858-966-7803

MOB/ENT: 3030 Children's Way, 1st Floor North
San Diego, CA 92123
Phone: 858-309-7701

ESCONDIDO

625 W. Citracado Pkwy., Suite 102
Escondido, CA 92025
Phone: 858-966-8100

MURRIETA

25170 Hancock Ave., Suite 175 (*Entrance 2*)
Murrieta, CA 92562
Phone: 858-966-8300

OCEANSIDE

3605 Vista Way, Suite 201
Oceanside, CA 92056
Phone: 858-966-8100

Rady Children's Health

3020 Children's Way | MC5010 | San Diego, CA 92123
858.576.1700
rchsd.org/programs-services/audiology-hearing