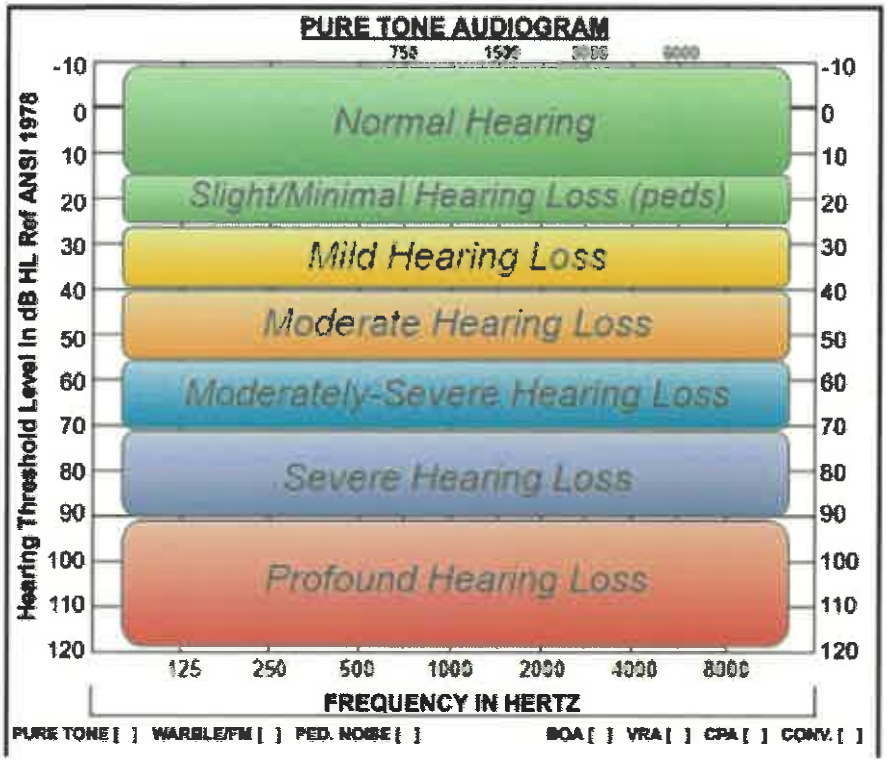
AUDIOLOGY CHEAT SHEET



AUDIOMETRY

Sound field or ear specific results charted by intensity and frequency.

X or □ = Left ear
O or △ = Right ear
[< >] = Bone conduction
S = Sound Field

SAT = Speech Awareness Threshold
SRT = Speech Reception Threshold

MIDDLE EAR ANALYSIS

Type A = Normal mobility
Type B = Abnormal mobility
Type C = Abnormal mobility

OTOACOUSTIC EMISSIONS

Objective, frequency specific responses; absent responses could indicate hearing loss; can be affected by middle ear status

TYPES OF HEARING LOSS

Conductive Hearing Loss (CHL) = typically not permanent, needs medical (ENT) involvement

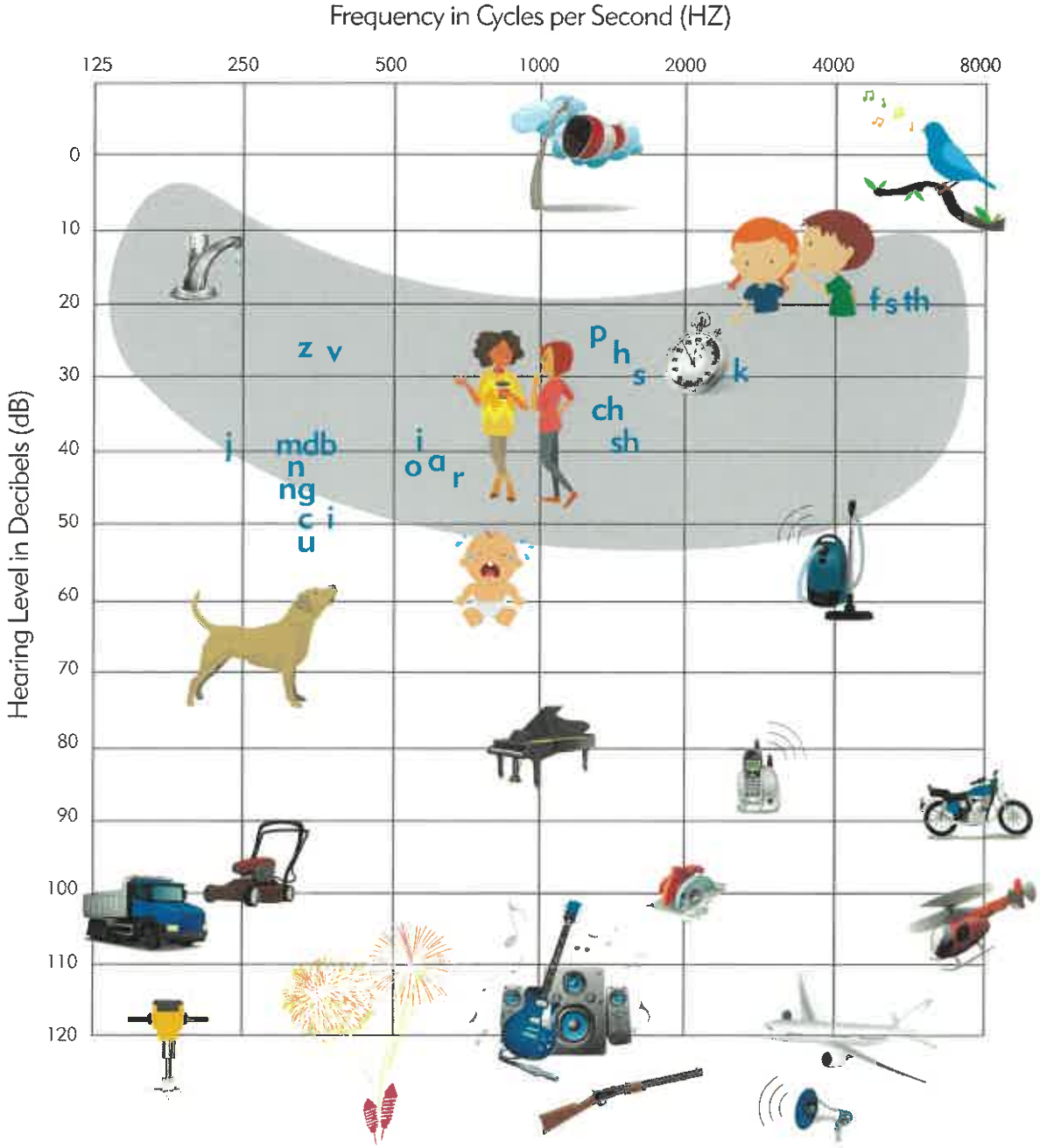
Sensorineural Hearing Loss (SNHL) = Permanent, can be progressive, depending on degree of hearing loss may benefit from hearing aid or cochlear implant

Mixed Hearing Loss = combination of CHL & SNHL

TOOLS for TODDLERS

Helping Babies and Toddlers get a **Strong Start**

AUDIOGRAM OF FAMILIAR SOUNDS



Advanced Bionics

For questions or additional information: Toll Free 1.877.829.0026 TTY 1.800.678.3575 Monday through Friday, 5am to 5pm PST

Web AdvancedBionics.com Email CustomerService@AdvancedBionics.com • ToolsforSchools@AdvancedBionics.com

American Speech-Language-Hearing Association
AUDIOLOGY Information Series

Type, Degree, and Configuration of Hearing Loss

When describing hearing loss, we generally look at three aspects: type of hearing loss, degree of hearing loss, and configuration of hearing loss.

TYPES OF HEARING LOSS

There are three basic types of hearing loss: conductive, sensorineural, and mixed.

○ **Conductive hearing loss** occurs when sound is not sent easily through the outer ear canal to the eardrum and the tiny bones (ossicles) of the middle ear. Conductive hearing loss makes sounds softer and less easy to hear. This type of hearing loss can often be corrected medically or surgically. Some possible causes of conductive hearing loss are:

- Fluid in the middle ear from colds or allergies
- Ear infection (otitis media)
- Poor eustachian tube function
- Hole in the eardrum
- Too much earwax (cerumen)
- Swimmer's ear (external otitis)
- Foreign body in the ear canal
- Malformation of the outer ear, ear canal, or middle ear

○ **Sensorineural hearing loss** (SNHL) happens when there is damage to the inner ear (cochlea) or to the nerve pathways from the inner ear to the brain. Most of the time, SNHL cannot be medically or surgically corrected. This is the most common type of permanent hearing loss.

SNHL reduces the ability to hear faint sounds. Even when speech is loud enough to hear, it may still be unclear or sound muffled.

Some possible causes of SNHL are:

- Drugs that are toxic to hearing
- Hearing loss that runs in the family (genetic or hereditary)
- Aging
- Head trauma
- Malformation of the inner ear
- Exposure to loud noise

○ **Mixed hearing loss** occurs when a conductive hearing loss happens in combination with an SNHL. In other words, there may be damage in the outer or middle ear and in the inner ear (cochlea) or auditory nerve.

DEGREE OF HEARING LOSS

Degree of hearing loss refers to the severity of the loss. The table below shows one of the more commonly used classification systems. The numbers are representative of the patient's hearing loss range in decibels (dB HL).

Degree of hearing loss	Hearing loss range (dB HL)
Normal	–10 to 15
Slight	16 to 25
Mild	26 to 40
Moderate	41 to 55
Moderately severe	56 to 70
Severe	71 to 90
Profound	91+

Source: Clark, J. G. (1981). Uses and abuses of hearing loss classification. *Asha, 23*, 493–500.

CONFIGURATION OF HEARING LOSS

The configuration, or shape, of the hearing loss refers to the degree and pattern of hearing loss across frequencies (tones) as illustrated in a graph called an audiogram. For example, a hearing loss that only affects the high tones would be described as a high-frequency loss. Its configuration would show good hearing in the low tones and poor hearing in the high tones.

On the other hand, if only the low frequencies were affected, the configuration would show poorer hearing

for low tones and better hearing for high tones. Some hearing loss configurations are flat, indicating the same amount of hearing loss for low and high tones.

Other descriptors associated with hearing loss are:

- **Bilateral versus unilateral.** Bilateral hearing loss means hearing loss in both ears. Unilateral hearing loss (UHL) means that hearing is normal in one ear but there is hearing loss in the other ear. The hearing loss can range from mild to very severe. UHL can occur in both adults and children.

  Approximately 1 out of every 10,000 children is born with UHL, and nearly 3% of school-age children have UHL. Children with UHL are at higher risk for having academic, speech-language, and social-emotional difficulties than their normal hearing peers. This may be because UHL is often not identified, and the children do not receive intervention.

  Below are some possible causes of UHL:

  - Hearing loss that runs in the family (genetic or hereditary)
  - An outer, middle, or inner ear abnormality
  - Syndromes such as Down and Usher syndrome
  - Illnesses or infections such as CMV, Rubella
  - Head injury
  - Exposure to loud noise
  - Traumatic brain injury (TBI)
- **Symmetrical versus asymmetrical.** Symmetrical means the degree and configuration of hearing loss are the same in each ear. Asymmetrical means the degree and configuration are different in each ear.
- **Progressive versus sudden hearing loss.** Progressive means that hearing loss becomes worse over time. Sudden means that the loss happens quickly. Such a hearing loss requires immediate medical attention to determine its cause and treatment.
- **Fluctuating versus stable hearing loss.** Fluctuating means hearing loss that changes over time—sometimes getting better, sometimes getting worse. Stable hearing loss does not change over time and remains the same.

NOTES:

For more information about hearing loss, hearing aids, or referral to an ASHA-certified audiologist, contact the:

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2200 Research Boulevard
Rockville, MD 20850
800-638-8255

E-mail: actioncenter@asha.org
Website: www.asha.org

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AUDIOLOGY Information Series

Childhood Hearing Loss

Early detection of hearing loss and early use of hearing aids or cochlear implants are critical for the development of speech, language, and communication skills in children with hearing loss. In fact, children identified with a hearing loss by 6 months of age who received a hearing aid or cochlear implant and habilitation services have been shown years later to have language skills similar to those of children of the same age who have normal hearing.

If your baby has failed newborn hearing screening in the hospital, you will be referred to an audiologist for the child to receive a complete diagnostic hearing test. Based on this testing, the audiologist will be able to tell you if your baby has a hearing loss and, if so, the type and degree of hearing loss, as well as provide you some ideas about what to do next.

Most parents know very little about hearing loss. If your child has been diagnosed with hearing loss, you will have much to learn. Fortunately, there are many people who are there to support you in this journey.

How We Hear

The ear can be divided into three parts leading up to the brain—the outer ear, middle ear, and inner ear.

- Outer ear: Sound travels down the ear canal, striking the eardrum and causing it to move or vibrate.
- Middle ear: Vibrations from the eardrum cause tiny bones to vibrate, which, in turn, creates movement of the fluid in the inner ear.
- Inner ear: Movement of the fluid sends electric signals from the inner ear up the auditory nerve (also known as the hearing nerve) to the brain.

The brain then interprets these electric signals as sound.

Types of Hearing Loss

Conductive hearing loss is caused by a problem in the outer or middle ear that blocks the normal flow of sound to the inner ear. This type of hearing loss is often medically or surgically treatable. Causes of conductive hearing loss include fluid in the middle ear, wax in the ear canal, malformation of the middle ear bones or ear canal, or a hole in the eardrum.

Sensorineural hearing loss is most often caused by a problem in the inner ear. This type of hearing loss is often permanent and cannot be medically or surgically treated. Causes of sensorineural hearing loss include genetic factors, lack of oxygen during birth, and prenatal infections.

Mixed hearing loss is caused by a combination of both conductive and sensorineural hearing loss in the same ear.

Auditory neuropathy (auditory dyssynchrony) occurs when the inner ear is working but the sound is not reaching the hearing nerve in the proper way. Sounds are either distorted or not heard at all.

Degree of Hearing Loss

The amount of hearing loss your child has is called the "degree" of hearing loss. The degree of hearing loss can be mild, moderate, severe, or profound. It is important to understand that even a "mild" hearing loss can affect your child's speech and language skills.

Hearing Tests

Audiologists use a number of different tests to help determine the type and amount of your child's hearing loss. Often, hearing aids will be recommended. Depending on the amount or degree of your child's hearing loss, cochlear implants may also be discussed. You will also be referred to the early intervention program in your area.

Hearing Aids/Cochlear Implants

Early detection of hearing loss and early use of hearing aids or cochlear implants are critical for the development of speech, language, and communication skills in children with hearing loss. In fact, infants identified with a hearing loss by 6 months of age who received a hearing

aid or cochlear implant and habilitation services have been shown years later to have language skills similar to those of children of the same age who have normal hearing.

Early Intervention Services

Hearing loss can have a major impact on a child's development, so early intervention services are critical. The services provided will depend on each child's individual needs and the wishes of the family. Usually, these services are provided in the home or in the location where your child spends most of his or her waking hours.

The type of communication method you decide to use with your child guides the early intervention plan. A variety of communication methods are available. You should select a method based on your needs and the needs of your child. Communication methods include the following:

Listening and spoken language (also referred to as auditory-verbal or auditory-oral): The infant or young child is fitted with hearing assistive devices. The child is then exposed to the language of the home through listening and talking, leading to spoken language in the home and school, and among peers.

Cued speech or cued language: This method utilizes specific hand shapes and placements around the face to clarify the ambiguity of lipreading.

American Sign Language (ASL): The infant or young child is exposed to language through vision, which leads to signed language in the home and school, and among peers. ASL's grammatical structure is different from that of spoken English.

Total communication: This method represents the simultaneous use of spoken language and English-based signed language.

NOTES:

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Effects of Hearing Loss on Development

It is well recognized that hearing is critical to speech and language development, communication, and learning. Children with listening difficulties due to a hearing loss or auditory processing problems continue to be at risk for developmental delays.

The earlier a hearing loss occurs in a child's life, the more serious the effects on the child's development. Similarly, the earlier the problem is identified and intervention begun, the less serious the ultimate impact.

There are four major ways in which a hearing loss affects children:

- It causes delay in the development of receptive and expressive communication skills (speech and language).
- The language deficit causes learning problems that result in reduced academic achievement.
- Communication difficulties often lead to social isolation and poor self-regard.
- It may have an impact on vocational choices.

SPECIFIC EFFECTS ON DEVELOPMENT

Vocabulary

- Vocabulary develops more slowly in children who have a hearing loss.
- Children with a hearing loss learn concrete words like *cat, jump, five,* and *red* more easily than abstract words like *before, after, equal to,* and *jealous.* They also have difficulty with function words like *the, an, are,* and *a.*
- The gap in vocabulary between children with normal hearing and those with a hearing loss widens with age. Children with a hearing loss do not catch up without intervention.
- Children with a hearing loss have difficulty understanding words with multiple meanings. For example, the word *bank* can mean the edge of a stream or a place where we put money.

Sentence Structure

- Children with a hearing loss understand and create shorter and simpler sentences than children with normal hearing.
- Children with a hearing loss often have difficulty understanding and writing complex sentences, such as those with relative clauses ("The teacher, whom I have for math, was sick today") or in the passive voice ("The ball was thrown by Mary").
- Children with a hearing loss often cannot hear word endings such as *-s* or *-ed.* This leads to misunderstandings and misuse of verb tense, pluralization, and possessives, as well as nonagreement of subjects and verbs.

Speaking

- Children with a hearing loss often cannot hear quiet speech sounds such as "s," "sh," "f," "t," and "k" and therefore do not include them in their speech. Thus, speech may be difficult to understand.
- Children with a hearing loss may not hear their own voice when they speak. They may speak too loudly or not loud enough. They may have a speaking pitch that is too high. They may sound like they are mumbling because of poor stress, poor inflection, or poor rate of speaking.

Academic Achievement

- Children with a hearing loss have difficulty with all areas of academic achievement, especially reading and mathematical skills.
- Children with a mild to moderate hearing loss, achieve one to four grade levels lower, on average, than their peers with normal hearing, unless appropriate management occurs.
- Children with a severe to profound hearing loss usually achieve skills no higher than the third- or fourth-grade level, unless appropriate educational intervention occurs early.

- The difference in academic achievement between children with normal hearing and those with a hearing loss usually widens as they progress through school.
- The level of achievement is related to parental involvement and the quantity, quality, and timing of the support services children receive.

Social Functioning

- Children with a hearing loss often report feeling alone, without friends, and unhappy in school, particularly when their socialization with other children with a hearing loss is limited.

WHAT YOU CAN DO

Recent research indicates that children identified with a hearing loss who begin services early may be able to develop language (spoken and/or signed) on a par with their hearing friends. If a hearing loss is detected in your child, early family-centered intervention is recommended to promote language (speech and/or signed depending on family choices) and cognitive development. An audiologist, as part of an interdisciplinary team of professionals, will evaluate your child and suggest the most appropriate audiologic intervention program. A speech-language pathologist will help you learn how to best work with your child to develop speech, language, and communication skills.

NOTES:

For more information and to view the entire Audiology Information Series library, scan with your mobile device.

For more information about hearing loss, hearing aids, or referral to an ASHA-certified audiologist, contact:

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Relationship of Hearing Loss to Listening and Learning Needs

Child's Name: **Date:**

16-25 dB HEARING LOSS

Possible Impact on the Understanding of Language and Speech	Possible Social Impact	Potential Educational Accommodations and Services
• Impact of a hearing loss that is approximately 20 dB can be compared to ability to hear when index fingers are placed in your ears. • Child may have difficulty hearing faint or distant speech. At 16 dB student can miss up to 10% of speech signal when teacher is at a distance greater than 3 feet. • A 20 dB or greater hearing loss in the better ear can result in absent, inconsistent or distorted parts of speech, especially word endings (s, ed) and unemphasized sounds. • Percent of speech signal missed will be greater whenever there is background noise in the classroom, especially in the elementary grades when instruction is primarily verbal and younger children have greater difficulty listening in noise. • Young children have the tendency to watch and copy the movements of other students rather than attending to auditorily fragmented teacher directions.	• May be unaware of subtle conversational cues which could cause child to be viewed as inappropriate or awkward. • May miss portions of fast-paced peer interactions that could begin to have an impact on socialization and self concept. • Behavior may be confused for immaturity or inattention. • May be more fatigued due to extra effort needed for understanding speech.	• Noise in typical classroom environments impede child from having full access to teacher instruction. Will benefit from improved acoustic treatment of classroom and sound-field amplification. • Favorable seating necessary. • May often have difficulty with sound/letter associations and subtle auditory discrimination skills necessary for reading. • May need attention to vocabulary or speech, especially when there has been a long history of middle ear fluid. • Depending on loss configuration, may benefit from low power hearing aid with personal FM system. • Appropriate medical management necessary for conductive losses. • Inservice on impact of "minimal" 16 – 25 dB hearing loss on language development, listening in noise and learning, required for teacher.

Comments:

Please Consider Indicated Items in the Child's Educational Program:

_____Teacher inservice and seating close to teacher _____Hearing monitoring at school every ____mos. _____Amplification monitoring

_____Contact your school district's audiologist _____Protect ears from noise to prevent more loss _____Educational support services/evaluation

_____Screening/evaluation of speech and language _____Note-taking, closed captioned films, visuals _____FM system trial period

_____Educational consultation/ program supervision by specialist(s) in hearing loss _____Regular contact with other children who are deaf or hard of hearing

_____Periodic educational monitoring such as October and April teacher/student completion of SIFTER, LIFE

NOTE: All children require full access to teacher instruction and educationally relevant peer communication to receive an appropriate education. Distance, noise in classroom and fragmentation caused by hearing loss prevent full access to spoken instruction. Appropriate acoustics, use of visuals, FM amplification, sign language, notetakers, communication partners, etc. increase access to instruction. Needs periodic hearing evaluation, rigorous amplification checks, and regular monitoring of access to instruction and classroom function (monitoring tools at www.hear2learn.com or www.SIFTERanderson.com).

Relationship of Hearing Loss to Listening and Learning Needs

Child's name: **Date:**

26-40 dB HEARING LOSS

Possible Impact on the Understanding of Language and Speech	Possible Social Impact	Potential Educational Accommodations and Services
• Effect of a hearing loss of approximately 20 dB can be compared to ability to hear when index fingers are placed in ears. • A 26 – 40 dB hearing loss causes greater listening difficulties than a "plugged ear" loss. • Child can "hear" but misses fragments of speech leading to misunderstanding. • Degree of difficulty experienced in school will depend upon noise level in the classroom, distance from the teacher, and configuration of the hearing loss, even with hearing aids. • At 30 dB can miss 25-40% of the speech signal. • At 40 dB may miss 50% of class discussions, especially when voices are faint or speaker is not in line of vision. • Will miss unemphasized words and consonants, especially when a high frequency hearing loss is present. • Often experiences difficulty learning early reading skills such as letter/sound associations. • Child's ability to understand and succeed in the classroom will be substantially diminished by speaker distance and background noise, especially in the elementary grades.	• Barriers begin to build with negative impact on self-esteem as child is accused of "hearing when he/she wants to," "daydreaming," or "not paying attention." • May believe he/she is less capable due to difficulties understanding in class. • Child begins to lose ability for selective listening, and has increasing difficulty suppressing background noise causing the learning environment to be more stressful. • Child is more fatigued due to effort needed to listen.	• Noise in typical class will impede child from full access to teacher instruction. • Will benefit from hearing aid(s) and use of a desk top or ear level FM system in the classroom. • Needs favorable acoustics, seating and lighting. • May need attention to auditory skills, speech, language development,speechreading and/or support in reading and self-esteem. • Amount of attention needed typically related to the degree of success of intervention prior to 6 months of age to prevent language and early learning delays. • Teacher inservice on impact of a 26 – 40 dB hearing loss on listening and learning to convey that it is often greater than expected.

Comments:

Please Consider Indicated Items in the Child's Educational Program:

_____Teacher inservice and seating close to teacher _____Hearing monitoring at school every ____mos. _____Amplification monitoring
_____Contact your school district's audiologist _____Protect ears from noise to prevent more loss _____Educational support services/evaluation
_____Screening/evaluation of speech and language _____Note-taking, closed captioned films, visuals _____FM system trial period
_____Educational consultation/ program supervision by specialist(s) in hearing loss _____Regular contact with other children who are deaf or hard of hearing
_____Periodic educational monitoring such as October and April teacher/student completion of SIFTER, LIFE

NOTE: All children require full access to teacher instruction and educationally relevant peer communication to receive an appropriate education. Distance, noise in classroom and fragmentation caused by hearing loss prevent full access to spoken instruction. Appropriate acoustics, use of visuals, FM amplification, sign language, notetakers, communication partners, etc. increase access to instruction. Needs periodic hearing evaluation, rigorous amplification checks, and regular monitoring of access to instruction and classroom function (monitoring tools at www.hear2learn.com or www.SIFTERanderson.com).

Relationship of Hearing Loss to Listening and Learning Needs

Child's name: **Date:**

41-55 dB HEARING LOSS

Possible Impact on the Understanding of Language and Speech	Possible Social Impact	Potential Educational Accommodations and Services
• Consistent use of amplification and language intervention prior to age 6 months increases the probability that the child's speech, language and learning will develop at a normal rate. • Without amplification, child may understand conversation at a distance of 3-5 feet, if sentence structure and vocabulary are known. • The amount of speech signal missed can be 50% or more with 40 dB loss and 80% or more with 50 dB loss. • Without early amplification the child is likely to have delayed or disordered syntax, limited vocabulary, imperfect speech production and flat voice quality. • Addition of a visual communication system to supplement audition may be indicated, especially if language delays and/or additional disabilities are present. • Even with hearing aids, child can "hear" but may miss much of what is said if classroom is noisy or reverberant. • With personal hearing aids alone, ability to perceive speech and learn effectively in the classroom is at high risk. • A personal FM system to overcome classroom noise and distance is typically necessary.	• Barriers build with negative impact on self-esteem as child is accused of "hearing when he/she wants to," "daydreaming," or "not paying attention." • Communication will be significantly compromised with this degree of hearing loss, if hearing aids are not worn. • Socialization with peers can be difficult, especially in noisy settings such as cooperative learning situations, lunch or recess. • May be more fatigued than classmates due to effort needed to listen.	• Consistent use of amplification (hearing aids + FM) is essential. • Needs favorable classroom acoustics, seating and lighting. • Consultation/program supervision by a specialist in childhood hearing impairment to coordinate services is important. • Depending on early intervention success in preventing language delays, special academic support will be necessary if language and educational delays are present. • Attention to growth of oral communication, reading, written language skills, auditory skill development, speech therapy, self-esteem likely. • Teacher inservice required with attention to communication access and peer acceptance.

Comments:

Please Consider Indicated Items in the Child's Educational Program:

_____Teacher inservice and seating close to teacher _____Hearing monitoring at school every ____mos. _____Amplification monitoring
_____Contact your school district's audiologist _____Protect ears from noise to prevent more loss _____Educational support services/evaluation
_____Screening/evaluation of speech and language _____Note-taking, closed captioned films, visuals _____FM system trial period
_____Educational consultation/ program supervision by specialist(s) in hearing loss _____Regular contact with other children who are deaf or hard of hearing
_____Periodic educational monitoring such as October and April teacher/student completion of SIFTER, LIFE

NOTE: All children require full access to teacher instruction and educationally relevant peer communication to receive an appropriate education.
Distance, noise in classroom and fragmentation caused by hearing loss prevent full access to spoken instruction. Appropriate acoustics, use of visuals, FM amplification, sign language, notetakers, communication partners, etc. increase access to instruction. Needs periodic hearing evaluation, rigorous amplification checks, and regular monitoring of access to instruction and classroom function (monitoring tools at www.hear2learn.com or www.SIFTERanderson.com).

Relationship of Hearing Loss to Listening and Learning Needs

Child's name: **Date:**

56-70 dB HEARING LOSS

Possible Impact on the Understanding of Language and Speech	Possible Social Impact	Potential Educational Accommodations and Services
• Even with hearing aids, child will typically be aware of people talking around him/her, but will miss parts of words said resulting in difficulty in situations requiring verbal communication (both one-to-one and in groups). • Without amplification, conversation must be very loud to be understood; a 55 dB loss can cause a child to miss up to 100% of speech information without functioning amplification. • If hearing loss is not identified before age one year and appropriately managed, delayed spoken language, syntax, reduced speech intelligibility and flat voice quality is likely. • Age when first amplified, consistency of hearing aid use and early language intervention strongly tied to success of speech, language and learning development. • Addition of visual communication system often indicated if language delays and/or additional disabilities are present. • Use of a personal FM system will reduce the effects of noise and distance and allow increased auditory access to verbal instruction. • With hearing aids alone, ability to understand in the classroom is greatly reduced by distance and noise.	• If hearing loss was late-identified and language delay was not prevented, communication interaction with peers will be significantly affected. • Children will have greater difficulty socializing, especially in noisy settings such as lunch, cooperative learning situations, or recess. • Tendency for poorer self-concept and social immaturity may contribute to a sense of rejection; peer inservice helpful.	• Full time, consistent use of amplification (hearing aids + FM system) is essential. • May benefit from frequency transposition (frequency compression) hearing aids depending upon loss configuration. • May require intense support in development of auditory, language, speech , reading and writing skills. • Consultation/supervision by a specialist in childhood hearing impairment to coordinate services is important. • Use of sign language or a visual communication system by children with substantial language delays or additional learning needs, may be useful to access linguistically complex instruction. • Note-taking, captioned films, etc. often are needed accommodations. • Teacher inservice required.

Comments:

Please Consider Indicated Items in the Child's Educational Program:

_____Teacher inservice and seating close to teacher _____Hearing monitoring at school every ____mos. _____Amplification monitoring

_____Contact your school district's audiologist _____Protect ears from noise to prevent more loss _____Educational support services/evaluation

_____Screening/evaluation of speech and language _____Note-taking, closed captioned films, visuals _____FM system trial period

_____Educational consultation/ program supervision by specialist(s) in hearing loss _____Regular contact with other children who are deaf or hard of hearing

_____Periodic educational monitoring such as October and April teacher/student completion of SIFTER, LIFE

NOTE: All children require full access to teacher instruction and educationally relevant peer communication to receive an appropriate education.

Distance, noise in classroom and fragmentation caused by hearing loss prevent full access to spoken instruction. Appropriate acoustics, use of visuals, FM amplification, sign language, notetakers, communication partners, etc. increase access to instruction. Needs periodic hearing evaluation, rigorous amplification checks, and regular monitoring of access to instruction and classroom function (monitoring tools at www.hear2learn.com or www.SIFTERanderson.com).

Relationship of Hearing Loss to Listening and Learning Needs

71-90 dB & 91+ dB HEARING LOSS

Possible Impact on the Understanding of Language and Speech	Possible Social Impact	Potential Educational Accommodations and Services
• The earlier the child wears amplification consistently with concentrated efforts by parents and caregivers to provide rich language opportunities throughout everyday activities and/or provision of intensive language intervention (sign or verbal), the greater the probability that speech, language and learning will develop at a relatively normal rate. • Without amplification, children with 71-90 dB hearing loss may only hear loud noises about one foot from ear. • When amplified optimally, children with hearing ability of 90 dB or better should detect many sounds of speech if presented from close distance or via FM. • Individual ability and intensive intervention prior to 6 months of age will determine the degree that sounds detected will be discriminated and understood by the brain into meaningful input. • Even with hearing aids children with 71-90 dB loss are typically unable to perceive all high pitch speech sounds sufficiently to discriminate them, especially without the use of FM. • The child with hearing loss greater than 70 dB may be a candidate for cochlear implant(s) and the child with hearing loss greater than 90 dB will not be able to perceive most speech sounds with traditional hearing aids. • For full access to language to be available visually through sign language or cued speech, family members must be involved in child's communication mode from a very young age.	• Depending on success of intervention in infancy to address language development, the child's communication may be minimally or significantly affected. • Socialization with hearing peers may be difficult. • Children in general education classrooms may develop greater dependence on adults due to difficulty perceiving or comprehending oral communication. • Children may be more comfortable interacting with deaf or hard of hearing peers due to ease of communication. • Relationships with peers and adults who have hearing loss can make positive contributions toward the development of a healthy self-concept and a sense of cultural identity.	• There is no one communication system that is right for all hard of hearing or deaf children and their families. • Whether a visual communication approach or auditory/oral approach is used, extensive language intervention, full-time consistent amplification use and constant integration of the communication practices into the family by 6 months of age will highly increase the probability that the child will become a successful learner. • Children with late-identified hearing loss (i.e., after 6 months of age) will have delayed language. • This language gap is difficult to overcome and the educational program of a child with hearing loss, especially those with language and learning delays secondary to hearing loss, requires the involvement of a consultant or teacher with expertise in teaching children with hearing loss. • Depending on the configuration of the hearing loss and individual speech perception ability, frequency transposition aids (frequency compression) or cochlear implantation may be options for better access to speech. • If an auditory/oral approach is used, early training is needed on auditory skills, spoken language, concept development and speech. • If culturally deaf emphasis is selected, frequent exposure to Deaf, ASL users is important. • Educational placement with other signing deaf or hard of hearing students (special school or classes) may be a more appropriate option to access a language-rich environment and free-flowing communication. • Support services and continual appraisal of access to communication and verbal instruction is required. • Note-taking, captioning, captioned films and other visual enhancement strategies are necessary; training in pragmatic language use and communication repair strategies helpful. • Inservice of general education teachers is essential.

Comments:

Please Consider Indicated Items in the Child's Educational Program:

_____Teacher inservice and seating close to teacher _____Hearing monitoring at school every ____mos. _____Amplification monitoring

_____Contact your school district's audiologist _____Protect ears from noise to prevent more loss _____Educational support services/evaluation

_____Screening/evaluation of speech and language _____Note-taking, closed captioned films, visuals _____FM system trial period

_____Educational consultation/ program supervision by specialist(s) in hearing loss _____Regular contact with other children who are deaf or hard of hearing

_____Periodic educational monitoring such as October and April teacher/student completion of SIFTER, LIFE

NOTE: All children require full access to teacher instruction and educationally relevant peer communication to receive an appropriate education.

Distance, noise in classroom and fragmentation caused by hearing loss prevent full access to spoken instruction. Appropriate acoustics, use of visuals, FM amplification, sign language, notetakers, communication partners, etc. increase access to instruction. Needs periodic hearing evaluation, rigorous amplification checks, and regular monitoring of access to instruction and classroom function (monitoring tools at www.hear2learn.com or www.SIFTERanderson.com).

Relationship of Hearing Loss to Listening and Learning Needs

Child's name: **Date:**

UNILATERAL HEARING LOSS

Possible Impact on the Understanding of Language and Speech	Possible Social Impact	Potential Educational Accommodations and Services
• Child can "hear" but can have difficulty understanding in certain situations, such as hearing faint or distant speech, especially if poor ear is aimed toward the person speaking. • Will typically have difficulty localizing sounds and voices using hearing alone. • The unilateral listener will have greater difficulty understanding speech when environment is noisy and/or reverberant, especially when normal ear is towards the overhead projector or other competing sound source and poor hearing ear is towards the teacher. • Exhibits difficulty detecting or understanding soft speech from the side of the poor hearing ear, especially in a group discussion.	• Child may be accused of selective hearing due to discrepancies in speech understanding in quiet versus noise. • Social problems may arise as child experiences difficulty understanding in noisy cooperative learning, or recess situations. • May misconstrue peer conversations and feel rejected or ridiculed. • Child may be more fatigued in classroom due to greater effort needed to listen, if class is noisy or has poor acoustics. • May appear inattentive, distractible or frustrated, with behavior or social problems sometimes evident.	• Allow child to change seat locations to direct the normal hearing ear toward the primary speaker. • Student is at 10 times the risk for educational difficulties as children with 2 normal hearing ears and 1/3 to 1/2 of students with unilateral hearing loss experience significant learning problems. • Children often have difficulty learning sound/letter associations in typically noisy kindergarten and grade 1 settings. • Educational and audiological monitoring is warranted. • Teacher inservice is beneficial. • Typically will benefit from a personal FM system with low gain/power or a sound-field FM system in the classroom, especially in the lower grades. • `Depending on the hearing loss, may benefit from a hearing aid in the impaired ear.

Comments:

Please Consider Indicated Items in the Child's Educational Program:

_____Teacher inservice and seating close to teacher _____Hearing monitoring at school every ____mos. _____Amplification monitoring

_____Contact your school district's audiologist _____Protect ears from noise to prevent more loss _____Educational support services/evaluation

_____Screening/evaluation of speech and language _____Note-taking, closed captioned films, visuals _____FM system trial period

_____Educational consultation/ program supervision by specialist(s) in hearing loss _____Regular contact with other children who are deaf or hard of hearing

_____Periodic educational monitoring such as October and April teacher/student completion of SIFTER, LIFE

NOTE: All children require full access to teacher instruction and educationally relevant peer communication to receive an appropriate education. Distance, noise in classroom and fragmentation caused by hearing loss prevent full access to spoken instruction. Appropriate acoustics, use of visuals, FM amplification, sign language, notetakers, communication partners, etc. increase access to instruction. Needs periodic hearing evaluation, rigorous amplification checks, and regular monitoring of access to instruction and classroom function (monitoring tools at www.hear2learn.com or www.SIFTERanderson.com).

Relationship of Hearing Loss to Listening and Learning Needs

Child's name: **Date:**

MID-FREQUENCY HEARING LOSS or REVERSE SLOPE HEARING LOSS

MID-FREQUENCY HEARING LOSS or REVERSE SLOPE

Possible Impact on the Understanding of Language and Speech	Possible Social Impact	Potential Educational Accommodations and Services
• Child can "hear" whenever speech is present but will have difficulty understanding in certain situations. • May have difficulty understanding faint or distant speech, such as a student with a quiet voice speaking from across the classroom. • The "cookie bite" or reverse slope listener will have greater difficulty understanding speech when environment is noisy and/or reverberant, such as a typical classroom setting. • A 25 – 40 dB degree of loss in the low to mid-frequency range may cause the child to miss approximately 30% of speech information, if unamplified; some consonant and vowel sounds may be heard inconsistently, especially when background noise is present. • Speech production of these sounds may be affected.	• Child may be accused of selective hearing or "hearing when he wants to" due to discrepancies in speech understanding in quiet versus noise. • Social problems may arise as child experiences difficulty understanding in noisy cooperative learning situations, lunch or recess. • May misconstrue peer conversations, believing that other children are talking about him or her. • Child may be more fatigued in classroom setting due to greater effort needed to listen. • May appear inattentive, distractible or frustrated.	• Personal hearing aids important but must be precisely fit to hearing loss. • Child likely to benefit from a sound-field FM system, a personal FM system or assistive listening device in the classroom. • Student is at risk for educational difficulties. • Can experience some difficulty learning sound/letter associations in kindergarten and 1st grade classes. • Depending upon degree and configuration of loss, child may experience delayed language development and articulation problems. • Educational monitoring and teacher inservice warranted. • Annual hearing evaluation to monitor for hearing loss progression is important.

Comments:

Please Consider Indicated Items in the Child's Educational Program:

_____Teacher inservice and seating close to teacher _____Hearing monitoring at school every ____mos. _____Amplification monitoring

_____Contact your school district's audiologist _____Protect ears from noise to prevent more loss _____Educational support services/evaluation

_____Screening/evaluation of speech and language _____Note-taking, closed captioned films, visuals _____FM system trial period

_____Educational consultation/ program supervision by specialist(s) in hearing loss _____Regular contact with other children who are deaf or hard of hearing

_____Periodic educational monitoring such as October and April teacher/student completion of SIFTER, LIFE

NOTE: All children require full access to teacher instruction and educationally relevant peer communication to receive an appropriate education. Distance, noise in classroom and fragmentation caused by hearing loss prevent full access to spoken instruction. Appropriate acoustics, use of visuals, FM amplification, sign language, notetakers, communication partners, etc. increase access to instruction. Needs periodic hearing evaluation, rigorous amplification checks, and regular monitoring of access to instruction and classroom function (monitoring tools at www.hear2learn.com or www.SIFTERanderson.com).

Relationship of Hearing Loss to Listening and Learning Needs

Child's Name: **Date:**

HIGH FREQUENCY HEARING LOSS

Possible Impact on the Understanding of Language and Speech	Possible Social Impact	Potential Educational Accommodations and Services
• Child can "hear" but can miss important fragments of speech. • Even a 26 – 40 dB loss in high frequency hearing may cause the child to miss 20%-30% of vital speech information if unamplified. • Consonant sounds t, s, f, th, k, sh, ch likely heard inconsistently, especially in the presence of noise. • May have difficulty understanding faint or distant speech, such as a student with a quiet voice speaking from across the classroom and will have much greater difficulty understanding speech when in low background noise and/or reverberation is present. • Many of the critical sounds for understanding speech are high pitched, quiet sounds, making them difficult to perceive; the words: cat, cap, calf, cast could be perceived as "ca," word endings, possessives, plurals and unstressed brief words are difficult to perceive and understand. • Speech production may be affected. • Use of amplification often indicated to learn language at a typical rate and ease learning.	• May be accused of selective hearing due to discrepancies in speech understanding in quiet versus noise. • Social problems may arise as child experiences difficulty understanding in noisy cooperative learning situations, lunch or recess. • May misinterpret peer conversations. • Child may be fatigued in classroom due to greater listening effort. • May appear inattentive, distractible or frustrated. • Could affect self concept.	• Student is at risk for educational difficulties. • Depending upon onset, degree and configuration of loss, child may experience delayed language and syntax development and articulation problems. • Possible difficulty learning some sound/letter associations in kindergarten and 1st grade classes. • Early evaluation of speech and language skills is suggested. • Educational monitoring and teacher inservice is warranted. • Will typically benefit from personal hearing aids and use of a sound-field or a personal FM system in the classroom. • Use of ear protection in noisy situations is imperative to prevent damage to inner ear structures and resulting progression of the hearing loss.

Comments:

Please Consider Indicated Items in the Child's Educational Program:

_____Teacher inservice and seating close to teacher _____Hearing monitoring at school every ____mos. _____Amplification monitoring

_____Contact your school district's audiologist _____Protect ears from noise to prevent more loss _____Educational support services/evaluation

_____Screening/evaluation of speech and language _____Note-taking, closed captioned films, visuals _____FM system trial period

_____Educational consultation/ program supervision by specialist(s) in hearing loss _____Regular contact with other children who are deaf or hard of hearing

_____Periodic educational monitoring such as October and April teacher/student completion of SIFTER, LIFE

NOTE: All children require full access to teacher instruction and educationally relevant peer communication to receive an appropriate education. Distance, noise in classroom and fragmentation caused by hearing loss prevent full access to spoken instruction. Appropriate acoustics, use of visuals, FM amplification, sign language, notetakers, communication partners, etc. increase access to instruction. Needs periodic hearing evaluation, rigorous amplification checks, and regular monitoring of access to instruction and classroom function (monitoring tools at www.hear2learn.com or www.SIFTERanderson.com).

Relationship of Hearing Loss to Listening and Learning Needs

Child's name: **Date:**

FLUCTUATING HEARING LOSS

Possible Impact on the Understanding of Language and Speech	Possible Social Impact	Potential Educational Accommodations and Services
• Of greatest concern are children who have experienced hearing fluctuations over many months in early childhood (multiple episodes with fluid lasting three months or longer). • Listening with a hearing loss that is approximately 20 dB can be compared to hearing when index fingers are placed in ears. • This loss or worse is typical of listening with fluid or infection behind the eardrums. • Child can "hear" but misses fragments of what is said. Degree of difficulty experienced in school will depend upon the classroom noise level, the distance from the teacher and the current degree of hearing loss. • At 30 dB can miss 25-40% of the speech signal. • A child with a 40 dB loss associated with "glue ear" may miss 50% of class discussions, especially when voices are faint or speaker is not in line of vision. • Child with this degree of hearing loss will frequently miss unstressed words, consonants and word endings.	• Barriers begin to build with negative impact on self esteem as the child is accused of "hearing when he/she wants to," "daydreaming," or "not paying attention." • Child may believe he/she is less capable due to understanding difficulties in class. • Typically poor at identifying changes in own hearing ability. With inconsistent hearing, the child learns to "tune out" the speech signal. • Children are judged to have greater attention problems, insecurity, distractibility and lack self esteem. • Tend to be non-participative and distract themselves from classroom tasks; often socially immature.	• Impact is primarily on acquisition of early reading skills and attention in class. • Screening for language delays is suggested from a young age. • Ongoing monitoring for hearing loss in school, communication between parent and teacher about listening difficulties and aggressive medical management is needed. • Will benefit from sound-field FM or an assistive listening device in class. • May need attention to development of speech, reading, self esteem, or listening skills. • Teacher inservice is beneficial.

Comments:

Please Consider Indicated Items in the Child's Educational Program:

_____Teacher inservice and seating close to teacher _____Hearing monitoring at school every ____mos. _____Amplification monitoring
_____Contact your school district's audiologist _____Protect ears from noise to prevent more loss _____Educational support services/evaluation
_____Screening/evaluation of speech and language _____Note-taking, closed captioned films, visuals _____FM system trial period
_____Educational consultation/ program supervision by specialist(s) in hearing loss _____Regular contact with other children who are deaf or hard of hearing
_____Periodic educational monitoring such as October and April teacher/student completion of SIFTER, LIFE

NOTE: All children require full access to teacher instruction and educationally relevant peer communication to receive an appropriate education. Distance, noise in classroom and fragmentation caused by hearing loss prevent full access to spoken instruction. Appropriate acoustics, use of visuals, FM amplification, sign language, notetakers, communication partners, etc. increase access to instruction. Needs periodic hearing evaluation, rigorous amplification checks, and regular monitoring of access to instruction and classroom function (monitoring tools at www.hear2learn.com or www.SIFTERanderson.com).