

Relationship of Hearing Loss to Listening and Learning Needs

MINIMAL HEARING LOSS (16-25 dB)

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 where instruction is primarily verbal. 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 which could begin to have an impact on socialization and self concept. May have immature behavior. May be more fatigued due to extra effort needed for understanding speech.	Due to noise in typical classroom environments which impede child from having clear 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 fine auditory discrimination skills necessary for reading. May need attention to vocabulary or speech, especially when there has been a history of ear problems. 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" hearing loss on language development, listening in noise and learning, required for teacher.

MILD HEARING LOSS (26-40 dB)

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. Mild hearing loss causes greater listening difficulties than a "plugged ear" loss. Child can "hear" but misses fragments 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. 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. With hearing aids alone, 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 understanding difficulties 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 equal 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 language development, auditory skills, articulation, speechreading and/or support in reading and self esteem, based on the degree of success of early intervention to prevent language and early learning delays. Teacher inservice on impact of so called "mild" hearing loss on listening and learning.

Please Consider in Child's Educational Program:

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|---|--|--|
| <input type="checkbox"/> Teacher inservice and seating close to teacher | <input type="checkbox"/> Hearing monitoring at school every ___mos. | <input type="checkbox"/> Amplification monitoring |
| <input type="checkbox"/> Contact your school district's audiologist | <input type="checkbox"/> Protect ears from noise to prevent more loss | <input type="checkbox"/> Educational support services/evaluation |
| <input type="checkbox"/> Screening/evaluation of speech and language | <input type="checkbox"/> Note-taking, closed captioned films, visuals | <input type="checkbox"/> FM system trial period |
| <input type="checkbox"/> Educational consultation/ program supervision by specialist(s) in hearing loss | <input type="checkbox"/> Regular contact with other children who are deaf or hard of hearing | |
| <input type="checkbox"/> Periodic educational monitoring such as April and October teacher/student completion of SIFTER, LIFE | | |

NOTE: All children require equal access teacher instruction to receive an appropriate education.

Distance, noise in classroom and fragmentation caused by hearing loss prevent access to spoken instruction. Use of visuals, FM classroom amplification, sign language, notetakers, communication partners, etc. provide access to instruction. All children with hearing loss require periodic audiological evaluation, rigorous amplification checks, and regular monitoring of their access to instruction and classroom function (see <http://www.hear2learn.com> for educational monitoring tools).

Relationship of Hearing Loss to Listening and Learning Needs

MODERATE HEARING LOSS (41-55 dB)

Possible Impact on the Understanding of Language and Speech	Possible Social Impact	Potential Educational Accommodations and Services
<p>Even with hearing aids, child can "hear" but typically misses much of what is said. Without amplification, understands conversational speech at a distance of 3-5 feet, if sentence structure and vocabulary are controlled. The amount of speech signal missed can be 50+% with 40 dB loss and 80+% with 50 dB loss. Child is likely to have delayed or disordered syntax, limited vocabulary, imperfect speech production and flat voice quality. Early consistent use of amplification and language intervention increases the probability that the child's speech, language and learning will develop more typically. Use of a visual communication system to supplement speech may be indicated, especially if large language delays and/or additional disabilities are present. Child will not have clear access to verbal instruction due to typical noise in class. 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 noise in the classroom and distance from the teacher may be necessary.</p>	<p>Barriers build with negative impact on self esteem as child is accused of "hearing when he/she wants to," "daydreaming," or "not paying attention." Often with this degree of hearing loss, if hearing aids are not worn communication will be significantly affected, and 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.</p>	<p>Consistent use of amplification (hearing aids + FM) is essential. Needs favorable classroom acoustics, seating and lighting. Consultation or program supervision by hearing impairment specialist to coordinate services is important. Depending on early intervention success in preventing language delays, special academic support may be necessary, especially for elementary grades. Attention to growth of oral communication, reading, written language skills, auditory skill development, speech therapy, self esteem likely. Teacher inservice required with attention to peer acceptance.</p>

MODERATE TO SEVERE HEARING LOSS (56-70 dB)

Possible Impact on the Understanding of Language and Speech	Possible Social Impact	Potential Educational Accommodations and Services
<p>Even with hearing aids, child can usually "hear" people talking around him/her, but will miss fragments of what is said resulting in difficulty in situations requiring verbal communication in both one-to-one and 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 working amplification. If hearing loss is not early identified and appropriately addressed, delayed spoken language, syntax, reduced speech intelligibility and flat voice quality likely. Age when amplified, consistency of hearing aid use and success of early language intervention strongly tied to speech, language and learning development. Use 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 to allow increased auditory access to verbal instruction. With hearing aids alone, ability to understand in the classroom is greatly impacted by distance and noise.</p>	<p>If hearing loss was late-identified and language delay was not prevented communication will be significantly affected, and socialization with peers can be difficult. 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.</p>	<p>Full time, consistent use of amplification (hearing aids + FM system) essential. May benefit from frequency transposition hearing aids depending upon loss configuration. May require intense support in language skills, speech, auditory skill development, reading and writing. Consultation/supervision by a specialist in hearing impairment 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. are needed accommodations. Teacher inservice required.</p>

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Relationship of Hearing Loss to Listening and Learning Needs

SEVERE HEARING LOSS (71-90 dB) & PROFOUND HEARING LOSS (91+ dB)		
Possible Impact on the Understanding of Language and Speech	Possible Social Impact	Potential Educational Accommodations and Services
<p>The younger the child wears amplification consistently and concentrated effort is made by parents and caregivers to provide rich language opportunities throughout everyday activities and/or intensive language intervention (sign or verbal) is provided, the greater the probability that speech, language and learning will develop at a relatively normal rate. Without amplification, children with severe hearing loss may only hear loud noises about one foot distant 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 early intensive intervention will determine the degree that sounds detected will be discriminated and processed by the brain into meaningful input. Even with hearing aids children with severe loss are typically unable to perceive all high pitch speech sounds sufficiently to discriminate them, especially without the use of FM. The child with severe to profound hearing loss may be a candidate for cochlear implant(s). The child with profound hearing loss will not be able to perceive most speech sounds without cochlear implant(s). 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.</p>	<p>Depending on success of early intervention toward language development, communication may be minimally or significantly affected. Socialization with hearing peers may be difficult. Children in mainstream classroom may develop greater dependence on adults due to difficulty perceiving or comprehending oral communication. Child 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.</p>	<p>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, early and extensive language intervention, full-time consistent amplification use and constant integration of the communication practices into the family 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 hearing loss, frequency transposition aids 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, speechreading, concept development and speech. If culturally deaf emphasis is used, frequent exposure to Deaf, ASL users is important. Self-contained educational placement with other signing deaf or hard of hearing students (special school or classes) may be a least restrictive option due to access to free-flowing communication. Support services and continual appraisal of access to communication and verbal instruction is required. Note-taking, captioned films necessary; training in communication repair strategies helpful. Inservice of mainstream teachers is essential.</p>
<p>Comments:</p>		

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Relationship of Hearing Loss to Listening and Learning Needs

UNILATERAL HEARING LOSS

Possible Impact on the Understanding of Language and Speech	Possible Social Impact	Potential Educational Accommodations and Services
Child can "hear" but will have difficulty understanding in certain situations, such as hearing faint or distant speech, especially if poor ear is aimed toward the person speaking. Will usually 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 with normal ear towards the overhead projector or other sound source and poor hearing ear 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 better ear toward the most effective listening position. Student is at risk for educational difficulties as 1/2 of students with unilateral hearing loss experience significant learning problems. Often have difficulty learning sound/letter associations in typically noisy kindergarten and grade 1 settings. Educational monitoring is warranted. Teacher inservice is beneficial. May benefit from hearing aid use. Will benefit from a sound-field FM system in the classroom, especially in lower grades, or a personal FM system with low gain/power.

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 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 mild 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 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 1 st 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.

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HIGH FREQUENCY HEARING LOSS

Possible Impact on the Understanding of Language and Speech	Possible Social Impact	Potential Educational Accommodations and Services
<p>Child can "hear" but will miss important fragments of speech. Even a mild 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 noise. Will have difficulty understanding faint or distant speech, such as a student with a quiet voice from across the classroom and will have much greater difficulty understanding speech even in low background noise 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 would 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.</p>	<p>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.</p>	<p>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 often 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 loss progression from hearing damage.</p>

FLUCTUATING HEARING LOSS

Possible Impact on the Understanding of Language and Speech	Possible Social Impact	Potential Educational Accommodations and Services
<p>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 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; 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; will frequently miss unstressed words, consonants and word endings.</p>	<p>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.</p>	<p>Primary impact is on acquisition of early reading skills and attention in class. Screening for language delays is necessary starting at a young age. Ongoing hearing monitoring in school with communication between parent and teacher about listening difficulties and ongoing aggressive medical management is necessary. Will benefit from sound-field FM system or an assistive listening device in class. May need attention to speech/language, reading, self esteem and listening skills development. Teacher inservice beneficial.</p>

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