

**DEGREE OF LONG-TERM HEARING LOSS
TO PSYCHOSOCIAL IMPACT AND EDUCATIONAL NEEDS**

<p align="center">Degree of Hearing Loss Based on modified pure tone average (500-4000 HZ)</p>	<p align="center">Possible Effect of Hearing Loss on the Understanding of Language & Speech</p>	<p align="center">Possible Psychological Impact of Hearing Loss</p>	<p align="center">Potential Educational Needs and Programs</p>
<p>NORMAL HEARING -10 - + 15 dB HL</p>	<p>Children have better hearing sensitivity than the accepted normal range for adults. A child with hearing sensitivity in the -10 to +15 dB range will detect the complete speech signal even at soft conversation levels. However, good hearing does not guarantee good ability to discriminate speech in the presence of background noise.</p>		
<p>MINIMAL (BORDERLINE) 16-25 dB HL</p>	<p>May have difficulty hearing faint or distant speech. At 15 dB student can miss up to 10% of speech signal when teacher is at a distance greater than 3 feet and when the classroom is noisy, especially in the elementary grades when verbal instruction predominates</p>	<p>May be unaware of subtle conversation 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. Child may be more fatigued than classmates due to listening effort needed.</p>	<p>May benefit from mild gain/low MPO hearing aid or personal FM system dependent on loss configuration. Would benefit from soundfield amplification if classroom is noisy and/or reverberant. Favorable seating. May need attention to vocabulary or speech, especially with recurrent otitis media history. Appropriate medical management necessary for conductive losses. Teacher requires inservice on impact of hearing loss on language development and learning.</p>
<p>MILD 26-40 dB HL</p>	<p>At 30 dB can miss 25-40% of speech signal. The degree of difficulty experienced in school will depend upon the noise level in classroom, distance from teacher and the configuration of the hearing loss. Without amplification the child with 35-40 dB loss may miss at least 50% of class discussions, especially when voices are faint or speaker is not in line of vision. Will miss consonants, especially when a high frequency hearing loss is present.</p>	<p>Barriers beginning to build with negative impact on self esteem as child is accused of "hearing when he or she wants to", "daydreaming", or "not paying attention". Child begins to lose ability for selective hearing, and has increasing difficulty suppressing background noise which makes the learning environment stressful. Child is more fatigued than classmates due to listening effort needed.</p>	<p>Will benefit from a hearing aid and use of a personal FM or soundfield FM system in the classroom. Needs favorable seating and lighting. Refer to special education for language evaluation and educational follow-up. Needs auditory skill building. May need attention to vocabulary and language development, articulation or speech reading and/or special support in reading. May need help with self esteem. Teacher inservice required.</p>

<p>MODERATE 41-55 dB HL</p>	<p>Understands conversational speech at a distance of 3-5 feet (face-to-face) only if structure and vocabulary controlled. Without amplification the amount of speech signal missed can be 50% to 75% with 40 dB loss and 80% to 100% with 50 dB loss. Is likely to have delayed or defective syntax, limited vocabulary, imperfect speech production and an atonal voice quality.</p>	<p>Often with this degree of hearing loss, communication is significantly affected, and socialization with peers with normal hearing becomes increasingly difficult. With full time use of hearing aids/FM systems child may be judged as a less competent learner. There is an increasing impact on self-esteem.</p>	<p>Refer to special education for language evaluation and for educational follow-up. Amplification is essential (hearing aids and FM system). special education support may be needed, especially for primary children. Attention to oral language development, reading and written language. Auditory skill development and speech therapy usually needed. Teacher inservice required.</p>
<p>MODERATE TO SEVERE 56-70 dB HL</p>	<p>Without amplification, conversation must be very loud to be understood. A 55 dB loss can cause child to miss up to 100% of speech information. Will have marked difficulty in school situations requiring verbal communication in both one-to-one and group situations. Delayed language, syntax, reduced speech intelligibility and atonal voice quality likely.</p>	<p>Full time use of hearing aids/FM systems may result in child being judged by both peers and adults as a less competent learner, resulting in poorer self concept, social maturity and contributing to a sense of rejection. Inservice to address these attitudes may be helpful.</p>	<p>Full time use of amplification is essential. Will need resource teacher or special class depending on magnitude of language delay. May require special help in all language skills, language based academic subjects, vocabulary, grammar, pragmatics as well as reading and writing. Probably needs assistance to expand experimental language base. Inservice of mainstream teachers required.</p>
<p>SEVERE 71-90 dB HL</p>	<p>Without amplification may hear loud voices about one foot from ear. When amplified optimally, children with hearing ability of 90 dB or better should be able to identify environmental sounds and detect all of the sounds of speech. If loss is of prelingual onset, oral language and speech may not develop spontaneously or will be severely delayed. If hearing loss is of recent onset speech is likely to deteriorate with quality becoming atonal.</p>	<p>Child may prefer other children with hearing impairments as friends or playmates. This may further isolate the child from the mainstream, however, these peer relationships may foster improved self concept and a sense of cultural identity.</p>	<p>May need full-time special aural/oral program for with emphasis on all auditory language skills, speechreading, concept development and speech. As loss approaches 80-90dB, may benefit from a Total Communication approach, especially in the early language learning years. Individual hearing aid/personal FM system essential. Need to monitor effectiveness of communication modality. Participation in regular classes as much as beneficial to student. Inservice of mainstream teachers essential.</p>
<p>PROFOUND 91 dB HL or more</p>	<p>Aware of vibrations more than tonal pattern. Many rely on vision rather than hearing as primary avenue for communication and learning. Detection of speech sounds dependent upon loss configuration and use of amplification. Speech and language will not develop spontaneously and is likely to deteriorate rapidly if hearing loss is of</p>	<p>Depending on auditory/oral competence, peer use of sign language, parental attitude, etc., child may or may not increasingly prefer association with the deaf culture.</p>	<p>May need special program for deaf children with emphasis on all language skills and academic areas. Program needs specialized supervision and comprehensive support services. Early use of amplification likely to help if part of an intensive training program. May be cochlear implant or vibrotactile aid candidate</p>

	recent onset.		requires continual appraisal of needs in regard to communication and learning mode. Part-time in regular classes as much as beneficial to student.
UNILATERAL One normal hearing ear and one ear with at least a permanent mild hearing loss	May have difficulty hearing faint or distant speech. Usually has difficulty localizing sounds and voices. Unilateral listener will have greater difficulty understanding speech when environment is noisy and/or reverberant. Difficulty detecting or understanding soft speech from side of bad ear, especially in group discussion.	Child may be accused of selective hearing due to discrepancies in speech understanding in quiet versus noise. Child will be more fatigued in classroom setting due to greater effort needed to listen. May appear inattentive or frustrated. Behavior problems sometimes evident.	May benefit from personal FM or soundfield FM system in classroom. CROS hearing aid may be of benefit in quiet settings. Needs favorable seating and lighting. Student is at risk for educational difficulties. Educational monitoring warranted with support services provided as soon as difficulties appear. Teacher inservice is beneficial.

NOTE: All children with hearing loss require periodic audiologic evaluation, rigorous monitoring of amplification and regular monitoring of communication skills. All children with hearing loss (especially conductive) need appropriate medical attention in conjunction with educational programming.

References:

Olsen, W.O., Hawkins, D.B. VanTassell, D.J. (1987). Representatives of the Longterm Spectrum of Speech. Ear & Hearing, Supplement 8, pp. 100-108.
 Mueller, H.G. & Killion, M.C. (1990). An easy method for calculating the articulation index. The Hearing Journal, 43, 9, pp. 14-22.
 Hasenstab, M. S. (1987). Language Learning and Otitis Media, College Hill Press, Boston, MA.

Developed by:

Karen L. Anderson, Ed.S & Noel D. Matkin, Ph.D (1991)

Adapted from:

Bernero, R.J. & Bothwell, H. (1966). Relationship of Hearing Impairment to Educational Needs. Illinois Department of Public Health & Office of Superintendent of Public Instruction.

Peer Review by:

Members of the Educational Audiology Association, Winter 1991.