

HOW HEARING LOSS IMPACTS COMMUNICATION

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SUMMARY

Hearing, or auditory processing, involves the use of many hearing skills in a single or combined fashion. The sounds that we hear can be characterized by their intensity (loudness), frequency (pitch), and timing. Impairment of any of the auditory structures from the visible ear to the central auditory nervous system within the brain can have a detrimental effect on how we perceive sounds, particularly those of speech. Thus, hearing loss is not just the inability to detect soft sounds. With hearing aids or cochlear implants, for example, some of these skills may be restored, but others may not. Therefore, it is unacceptable to assume that once fitted with a hearing aid or cochlear implant, hearing is normal again. Also, the impact of hearing loss is not limited to just loss of certain skills. Hearing loss may also have non-auditory effects as well.

KEY CONCEPTS

Loss of Audibility

Perhaps the most debilitating affect of hearing loss is reduced audibility. Reduced audibility means that sounds will either be too soft or completely undetected. With an absence of audibility, a student can feel cut off from the world. Students with hearing loss who can benefit from hearing aids will have partial and sometimes full restoration of audibility depending on the degree and configuration of their hearing loss. Unfortunately, an improvement in audibility does not always mean improved speech understanding. Audibility of sounds also is affected by distance between the sound source and the listener. As a general rule, sound levels drop by half for every doubling of distance from the sound source.

Poor Frequency Resolution

Students with hearing loss may not be able to tune out certain frequencies while attending to others. The ability to do this depends on basic frequency-tuned filters in the inner ear. With hearing loss, these inner ear filters do not work as efficiently. Instead, there is a smearing of frequencies in both simple tone discrimination and

processing of complex and competing sounds. For example, small group discussions in a classroom with other small groups simultaneously communicating may be difficult for a student with hearing loss.

Poor Temporal Resolution

The sounds that we hear, although they can be reproduced, have a finite presence. In other words, we hear them and they quickly fade away. Thus, sound has a time component. A reduction of temporal (time) resolution is evident in three ways: a person with hearing loss may have difficulty with (1) discriminating two similar words that differ in time (e.g., dad vs. bad), (2) separating speech and noise signals that fluctuate and overlap in time, and (3) resolving speech in highly reverberant (echoing) rooms (e.g., chemistry lab, cafeteria, or gymnasium).

Potential Loss of Binaural Hearing Advantages

Having two ears with comparable function has been shown to provide several advantages over one ear alone:

- Two ears can produce a perceptual doubling of loudness,
- Two ears can actually make it easier to listen in noise, and
- Two ears are necessary for sound localization.

Having two ears (one hearing device in each ear) generally can help with the first two binaural advantages. The more severe the hearing loss, the third binaural advantage may never be evident. Perhaps even more important is that it can no longer be assumed that a person with a unilateral hearing loss (one normal hearing ear and one deaf ear) will have the same auditory skills as someone who has normal hearing in both ears. In fact, the U.S. Census Bureau reports that hearing loss in either one or two ears negatively impacts employment.

Psychosocial Aspects of Hearing Loss and Related Health Issues

Hearing loss has the potential to reduce psychosocial functioning, which can lead to increased feelings of isolation, depression, loneliness, anger, fear, frustration, and disappointment. When psychosocial

function is reduced, a student's physical health also may be affected. Evidence for improved psychosocial functioning, quality of life, and health status can be seen in numerous reports of the use of hearing aids and cochlear implants.

Fatigue

Any difficulty hearing can lead to a greater reliance on vision and increased listening effort for speech understanding. When visual cues are supplemented with auditory cues for the purpose of understanding speech, it is called speechreading. Unfortunately, speechreading does not come easily to all students with hearing loss, and some may never reach fluency. Constant "active" listening without breaks can result in fatigue.

SUGGESTIONS FOR ACTION

- Consider architectural barriers to communication and learning within classrooms and other instructional settings.
- Preferential seating does not always mean up-front and center of a classroom. Students may benefit from added visual cues by sitting where they can see all or most students in the classroom (e.g., corner

seat away from the door). Plus, the closer to the instructor, the better.

- Pre-teach behavioral or cognitive (top-down) compensatory strategies to students so that they can self-accommodate in any classroom situation.
- Have students consider trying an assistive listening device or speech-to-text services in the classroom.
- Group discussions do not have to be difficult. Group activities can be powerful educational strategies, as long as the student with hearing loss has equal access to the discussions. For example, electing a group moderator is an excellent way to ensure that only one person speaks at a time.
- Use captioned or subtitled videos, or find/devise alternatives to accessing the same material. If audio examples are used, provide written material.
- Consider having large blocks of down-time between class schedules to minimize fatigue.
- Develop back-up strategies when personal hearing devices are being repaired or auxiliary services have been disrupted.
- Students with unilateral hearing losses may benefit from some assistance to enhance or ensure accessibility to classroom instruction.

ADDITIONAL RESOURCES

Carmen, R. (2004). *The consumer handbook on hearing loss and hearing aids: a bridge to healing*. Sedona, AZ: Auricle Ink Publishers.

Cohen, S.M., Labadie, R.F., Dietrich, M.S., & Haynes, D.S. (2004). Quality of life in hearing-impaired adults: the role of cochlear implants and hearing aids. *Otolaryngol Head Neck Surg*, 131(4), 413-422.

Harvey, M. (2004). *Odyssey of hearing loss: tales of triumph*. San Diego: CA: Dawnsign Press.

Lieu, J.E. (2004). Speech-language and educational consequences of unilateral hearing loss in children. *Arch Otolaryngol Head Neck Surg*, 130(5), 524-530.

Mo, B., Lindbaek, M., & Harris, S. (2005). Cochlear implants and quality of life: a prospective study. *Ear Hear*, 26, 186-194.

Consumer Resources

Association of Medical Professionals with Hearing Losses
<http://www.amphl.org/>

Association of Late-Deafened Adults
<http://www.alda.org/>

Healthy Hearing Online
<http://www.healthyhearing.com/>

Hearing Health Magazine
<http://www.drfl.org/magazine/>

Hearing Loss Association of America
<http://www.hearingloss.org/>

League for the Hard of Hearing
<http://www.lhh.org>

Professional Resources

Academy of Rehabilitative Audiology
<http://www.audrehab.org/>

American Speech-Language-Hearing Association
<http://www.asha.org/>

American Academy of Audiology
<http://www.audiology.org/>

For more information contact:

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